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ABSTRACT

This document consists of 12 issues, an entire volume year, of the EDUTECH Report published between April 1996 and March 1997. The newsletter's purpose is to alert faculty and administrators to issues in educational technology. Each issue typically contains two feature articles, a page of news briefs, a preview of the upcoming issue, and a question and answer column. The cover articles are as follows: (1) "The Coming Ubiquity of Information Technology" (Kenneth C. Green); (2) "Should the Maytag Repairman Run Your Help Desk?" (Howard Strauss); (3) "Questions To Ask about Your Administrative System"; (4) "The Productivity Paradox, Revisited" (Judith Brodnicki); (5) "Reflections of an On-Line Graduate" (Emily Weiner); (6) "Hot Issues 1996-97"; (7) "Ten Commandments for IT Groups" (Howard Strauss); (8) "Liberal Education in the Age of Technology" (Samuel R. Williamson); (9) "Information Technology Strategic Planning"; (10) "A Neo-Luddite Reflects on the Internet" (Gertrude Himmelfarb); (11) "Best-of-Breed or Integrated Package: Is There One Right Answer? First of a Two-Part Series" (Thomas Warger); and (12) "Best-of-Breed or Integrated Package: Is There One Right Answer? Second of a Two-Part Series" (Thomas Warger). (AEF)

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THE EDUTECH REPORT

April 1996

Volume 12
Number 1

The Education Technology Newsletter for Faculty and Administrators

ED 406 965

The Coming Ubiquity of Information Technology

Kenneth C. Green, Claremont Graduate School

Academic pundits frequently comment that the pace of innovation in higher education can be measured by the forty years it took to get the overhead projector out of the bowling alley and into the classroom. The (few) pundits who know something about both bowling and technology often add that faculty are now far more likely to find computerized projection systems in bowling alleys than in college classrooms.

But something significant is happening. Fueled by more than four decades of aspirations and a dozen years of sustained (if often ad hoc) experimentation, information technology has finally emerged as a permanent, respected, and increasingly essential component of the college experience. New data from the annual *Campus Computing Survey*, now in its sixth year, indicate a major gain in the proportion of college courses (and by extension, college faculty) using information technology as an instructional resource. These data reveal that the use of information in instruction is finally breaking past the innovators and early adopters and into the ranks and experience of mainstream faculty.

A rapidly rising minority of all of college students and faculty—some 16 million people—now have some sort of recurring instructional experience with information technology resources and technology-based learning activities. These are activities that go beyond the use of word processing (at one end of the continuum) and computer programming (at the other); rather, these are experiences that extend the content of the syllabus, enrich the classroom discourse, and enhance the learning opportunity. Although the technology experience may not be universal, the presence of technology in the learning environment is increasingly

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"We are in the middle of a transition period that is having an impact on the world greater than almost anything that has come before. But complaining about the lack of productivity gains at this point is analogous to complaining about your 10-year-old's failure to earn a good living.... I firmly believe that technology offers us a tremendous amount, but we must all keep a level head about not only what technology can do, but—even more important—what we can do with it."

Robert Bruen
MIT
Letter to the Editor
Chronicle of Higher Education
April 12, 1996

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NEWSBRIEFS

SNOWMASS SEMINARS

Despite the fact that many across the country, especially those in the Northeast, are convinced that there will be no summer this year, a regular summer event will be taking place as usual this August. The world-famous and guaranteed-great-fun Snowmass Seminars in Academic Computing will once again be held in Snowmass Village, Colorado, August 2–7. There are three seminars; the first is for University Executives (senior officers and faculty who have an overall level of involvement in campus academic computing and information technologies) entitled "IT-Assisted Learning: Dream or Reality?," August 2–4. The second seminar is for new Information Resource Directors, "A Survival Training Workshop," August 4; and the third is for Directors, "From Breakdowns to Breakthroughs," August 4–7.

The Seminars' mission is to provide a forum to discuss, debate, and exchange ideas on issues of common concern for those whose responsibilities and interests include computing, communications and information technology services in higher education. For further information, contact Gigi Bruce at Oregon State University; (541) 737-0732; bruceg@ccmail.orst.edu or see the Snowmass Web site at http://www.orst.edu/groups/sac/index.html.

COMPUTER POLICY AND LAW

A program entitled "Computer Policy and Law" will be put on by Cornell University on August 6–8 in Ithaca, New York. This program is meant for information technology professionals, university counsel, and judicial administrators, and will cover topics such as enforcing technology use policies; ethics in cyberspace; current cases and model policies; the Communications Decency Act; and emerging technologies.

The fee is $895. For more information, contact Computer Policy and Law, Box 602, B20 Day Hall, Cornell University, Ithaca, New york 14853; (607) 255-7259; sp@sce.cornell.edu; http://www.sce.cornell.edu/exec/.

LEARNING AND TECHNOLOGY

The 29th annual conference of the Association of Small Computer Users in Education (ASCUE) will be held this year on June 9–13 at the Ocean Creek Resort and Conference Center in Myrtle Beach, South Carolina. The major theme, "Learning and Technology: Is the Future Now?," will be examined through presentations and panels, roundtable discussions, invited speakers, and pre-conference workshops, including day-long interactive management workshops. There will also be a great deal of informal interaction and Birds-of-a-Feather sessions.

For more information, contact Dagrun Bennett, ASCUE Secretary, Franklin College, 501 East Monroe Street, Franklin, Indiana 46131; (317) 738-8150; bennett@minnie.franklincoll.edu, or check out the ASCUE Web site at http://www.depauw.edu/conf/ascue/ascue.htm.

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Advice for Jim Stevens

Editor's note: *Jim Stevens, a higher-ed CIO, presented our readers with a dilemma a couple of months back: how to make the best use of an Information Technology Policy Committee. Stevens expressed considerable frustration over his inability to get his institution's committee to focus on the right issues, increase the resources for his department, and even to get the right people to attend the meetings. These are selections from the many responses we received.*

"The issue about the committee members sending their representatives is a simple one. The original members are not sufficiently interested in what happens at the meetings, so they think it isn't worth their time to attend. At least partly, that can be corrected by presenting agendas and problems that are high level, stimulating, and do not degenerate into day-to-day operational problem solving. You have to keep things at a strategic level if you want the higher-level people to attend regularly."

"If the committee meetings are focused on 'trivia,' as you say, then that's what is occupying the minds of the committee members. It's like Maslow's hierarchy of needs—you can't focus on the higher-level need of self-actualization until the basic needs are fulfilled, like food and shelter. Likewise, a user community can't focus on long-range IT plans and values with hard disk crashes every other day and a three-month wait for a network connection. Provide a basic, reliable level of service and you'll be surprised how fast the users start helping you look at the bigger picture."

"Actually, you shouldn't be chairing the meetings. This shouldn't be your committee; it should be an advisory committee to the president, with you serving as a resource for the committee's workings. Deciding on the agenda items should benefit from your input, of course, but ultimately should be the decision of the committee chair. This is one way to provide the committee members with some assurance that this is not just a show-and-tell meeting for the IT folks, but that important issues *that are relevant to them* are going to be discussed."

A user community can't focus on long-range IT plans and values with hard disk crashes every other day and a three-month wait for a network connection. Provide a basic, reliable level of service and you'll be surprised how fast the users start looking at the bigger picture.

"We had exactly the same problems when we first started our committee up. It turned out that the underlying reason was that the president didn't really care whether this committee existed or not, and didn't pay much attention to its findings and recommendations. When we got a new president last year who felt differently, the committee all of sudden became much more important, and as a result, it also became much more responsible in its workings."

"It's interesting that you saw the committee as a vehicle for getting more resources. It has actually worked that way in our case, but not until the committee members became convinced that we were using the resources we already had properly. It took a long time to make that case and to engage in the mutual education that is the real purpose of this kind of committee."

"The response from my administration when a consultant recommended having this kind of committee was very negative. Their feeling was that the reason they hire professionals to manage IT was to make these kinds of important, high-level decisions, and that a committee would simply waste the time of everyone involved. I couldn't agree more. Disbanding yours is probably the best thing you can do for your institution."

"There is one basic purpose for an IT Policy Committee: communication." It is the responsibility of the upper administration of the institution to set the institution's outlook and direction; it is the responsibility of the IT folks to do what's necessary to support that outlook and help achieve that direction. Somewhere between the two there needs to stand a communications vehicle to make sure the outlook and direction are properly understood, funded, and implemented. A CIO is usually not able to do that alone (if for no other reason than he or she is open to the charge of 'turf-building' every time a need-more-resources issue rears its ugly head), but can work with an IT Policy Committee to build greater understanding and mutually beneficial alliances throughout the institution."

"Hang in there, friend. This committee really can become your ally, and even your advocate; it's just a matter of time and patience." ■

The Coming Ubiquity of Information Technology...

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common: an e-mail address on a course syllabus; electronic mail as a supplement to office hours; class sessions held in computer labs; desktop computers in faculty offices; commercial software and simulations as part of the resources provided by textbook publishers; and course assignments that send students to World Wide Web sites in search of information resources. These examples and others all reflect the new significance of information technology in the instructional domain—across almost all disciplines and in virtually all campus contexts, from elite research universities to community colleges.

Admittedly, there is great variation across academic programs and institutions. Students and faculty in research universities and elite institutions are far more likely to own and use computers than their peers in community colleges. But the growing use of information technology in instruction indicates significant change. It reflects more than the aggregated impact of rising levels of computer ownership among college students (now at about 33 percent, but approaching 80 percent or more at some institutions) and faculty (over 50 percent across all of academe but close to 100 percent on some campuses). And it extends beyond prior exposure as reflected by the growing numbers of American families that have a computer in the home (approaching 40 percent) or the secondary school experience of the majority of entering college freshmen who report a half-year or more of some sort of computer training during high school. It demonstrates the diffusion of information technology across all sectors of higher education, rather than increased use in those institutions with a strong technology base and long institutional history of support for instructional innovations and technology experiments.

As noted above, the *1995 Campus Computing* data reveal dramatic recent changes in the use of information technology in instruction.

> ***Fueled by more than four decades of aspirations and a dozen years of sustained experimentation, information technology has finally emerged as a permanent, respected, and increasingly essential component of a college experience.***

For example, the proportion of college courses using some form of IT resource rose significantly between 1994 and 1995, increasing by at least one-half and in some cases doubling. These dramatic gains represent important changes in the way growing numbers of faculty across all types of institutions and in all disciplines develop their courses, select content for the syllabus, present material in class, structure course assignments, and evaluate student performance.

Clearly not all faculty are passionate (or even frequent) computer users and not all courses have a technology component. Moreover, some of the technology applications that are common in many courses today are decidedly "low-tech" such as the use of word processing for preparing class papers.

Yet one seemingly "low-tech" tool—electronic mail—is quickly becoming a significant resource in instruction: on many campuses e-mail has become an important supplement to office hours and class discussion, allowing students to communicate with faculty and one another outside of the classroom. Indeed, the rapid spread of electronic mail over the past year represents a major innovation: it reflects a new level of technology utilization by faculty (and students) that moves the computing and technology experience off of the desktop and out of the office and into a rich and networked world where faculty are "connected"—to one another via e-mail, to the Internet and to resources on the Web, and to disciplinary colleagues for scholarly communication and professional correspondence (not to mention a little bit of academic gossip!). Although word processing and e-mail may not be hallmarks of technological skill and sophistication, they have become, nonetheless, core tools.

Other "low-tech" tools are also being adapted to instruction. For example, the growing use of presentation handouts has been aided in large part by the software industry's transition to software "suites" that bundle several applications into an aggressively priced package. The discounting involved with software suites, especially for campuses with site licenses, has made the suites very attractive products; once installed, the presentation software is readily available to large numbers of faculty who may have had little initial interest but

Kenneth C. Green is the director of the Campus Computing Project and a visiting scholar at the Claremont Graduate School. This article also appears in similar form in the March-April issue of Change magazine. *© Kenneth C. Green, 1996.*

eventually experimented with the new tool out of curiosity and collegial encouragement.

In other instances, these gains reflect the fact that infrastructure fosters innovation. Even though the level remains low, the instructional use of CD-ROM-based materials and multimedia resources doubled over the past year, in large part a direct result of new multimedia-capable computers in student dorms, campus labs, and faculty offices. On many campuses, recent enhancements reflect the replacement of obsolete equipment rather than a net gain in the total number of computers in campus labs and faculty offices. Similarly, the growing use of commercial courseware and computer simulations is directly linked to the role of textbook publishers and other firms creating these materials for the college and university market.

Taken together, these data point to the importance of infrastructure as a catalyst for innovation and the integration of technology. Too, the data suggest that instructional use will continue to rise, accompanied by growing demand for expanded and enhanced infrastructure resources and services—more and more powerful computers in campus labs and faculty offices; more support personnel to assist and train faculty and students; richer and more sophisticated instructional software and multimedia products from commercial developers and publishers.

Indeed, user support issues represent a major financial, operational, and technical challenge for most institutions. Replacing aging equipment, updating obsolete software, and supporting the exploding student and faculty interest in the Web are top institutional concerns according to the 1995 survey.

Yet the data also suggest that some aspects of user support have not expanded to meet growing demand. For example, although the use of technology in courses has increased dramatically in recent years, the proportion of colleges and universities that have expanded their investment in instructional development (i.e., providing assistance to faculty eager to use technology in their instructional activities) has remained flat over the past six years. Several factors explain the "demise" of instructional development, including: the learning curve, in that developing really good, really useful instructional "stuff" is far more complex than originally anticipated; sustained investment since institutions have learned that instructional development is not a static activity; much lower levels of patron support; and a pressing demand for more traditional user training in core applications.

These dramatic one-year gains represent important changes in the way faculty develop their courses, select content for the syllabus, present material in class, structure course assignments, and evaluate student performance.

The *Campus Computing* data also indicate that the use of information technology has reached what diffusion theorist Everett Rogers calls critical mass: "the point at which enough individuals have adopted an innovation so that the innovation's further rate of adoption becomes self-sustaining." Rogers' widely acclaimed work suggests that critical mass typically occurs when about 15 or 20 percent of a target population (in this case college faculty) adopt a new innovation. Our survey data suggest that most colleges and universities have finally passed the point of critical mass affecting the instructional use of information technology.

Interestingly, the use of information technology resources is often greater in community colleges than other sectors. To some this may be surprising, given that the technology infrastructure in two-year institutions, as measured by traditional indicators (computer ownership among students and faculty, status of the campus network, the number of technology support staff) is generally less well developed and less well funded than in elite institutions and research universities. But community colleges lead on certain measures reflecting the use of information technology in instruction.

Perhaps the best way to view these results is in the context of institutional mission: community colleges have a focused teaching mission, consequently, the broader use of certain kinds of information technology resources is consistent with that mission, even absent significant financial resources to support an in-depth or high-tech technology implementation effort.

How should faculty, administrators, and campus committees assess the impact of these recent changes in the use of technology in instruction? Have we really witnessed a "computer revolution" or

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Recommended Reading

We're nearing the end of the school year, things are slowing down a bit, and it's time to start thinking about how to catch up on some of the important things we've been putting off, such as keeping up to date on the latest writings in our field.

Transforming Higher Education: A Vision for Learning in the 21st Century, by Michael Dolence and Donald Norris, is a very stimulating discussion of the proposition that our colleges and universities really only have two choices for their future: change or die. This proposition is based on how Dolence and Norris see the learners themselves, and the ways in which their needs are changing in the new age of technology. The book then goes on to explain, in chapters with titles such as "Realigning With the Information Age Environment," "Redesigning to Meet the Needs of Information Age Learners," and 'Redefining Roles, Responsibilities, and Productivity," how to make the right kind of change happen. This is an important and provocative book, one that should be read by everyone on campus, especially those responsible for making strategic decisions.

Administrative Computing in Higher Education: Issues in Enterprise-Wide Networks and Systems, edited by Les Lloyd, is a multiple-author book focused on this very consternating and rapidly changing arena of administrative technology. As much as we can see the advances and progress being made on the academic side, nothing rivals the speed with which things are changing for administrators. Graphical user interfaces, networked information, client-server technology, relational databases, desktop power and ease-of-use are all combining to make this environment, while full of enormous potential, very difficult to manage. This book presents the viewpoints and experiences from a wide variety of institutions to help gain insight into these management challenges.

Assessing the Academic Networked Environment: Strategies and Options, by Charles McClure and Cynthia Lopata, offers a solid foundation, one that will be built on in the years to come, in trying to come to grips with four key questions: 1) What is the volume and type of networking taking place on campus? 2) Who are the users and what types of services are they using? 3) How much does this all cost? and 4) How has networking affected teaching, research, learning, service, and other aspects of traditional academic life? These are questions that campuses everywhere are asking themselves, as the demand for networking increases exponentially (what campus has not yet at least begun making plans to wire its residence halls?) and as the associated costs become more and more of a burden. This book, while not a cookbook per se, provides (all in one place for the first time) a tremendously valuable way to go about answering this difficult collection of questions. It discusses data collection, key issues, and how to do an evaluation; it offers specific measures to use; and it even provides a sample user survey.

The writing of *Using Information Technology to Enhance Academic Productivity*, by William Massy and Robert Zemsky, began with the question of how the infusion of academic technology into the educational process can reverse the declining productivity of American higher education. Through an Educom-sponsored roundtable discussion with administrators, policy analysts, faculty members, and consultants, Massy and Zemsky derived this white paper. It begins with two observations: 1) The demand for IT-based teaching and learning programs will grow substantially over the next decade, and 2) IT will change teaching and learning profoundly, although the transformation may take a long time. (Interestingly, there is a similar argument here to the one offered by Dolence and Norris about higher education's *need* to change at the risk of being threatened eventually with irrelevance.) Although looking at this issue in economic terms will be unsettling to some—even the word "productivity" in academia may be scary—it is very important to do so. ■

Transforming Higher Education: A Vision for Learning in the 21st Century, by Michael G. Dolence and Donald M. Norris, published by the Society for College and University Planning, 4251 Plymouth Road, Suite D, Ann Arbor, Michigan 48105, (313) 998-7832, http://www.umich.edu/~scup/.

Administrative Computing in Higher Education: Issues in Enterprise-Wide Networks and Systems, edited by Les Lloyd, published by Information Today, Inc., 143 Old Marlton Pike, Medford, NJ 08055.

Assessing the Academic Networked Environment: Strategies and Options, by Charles R. McClure and Cynthia L. Lopata, published by the Association of Research Libraries for the Coalition for Networked Information, 21 Dupont Circle, Suite 800, Washington, DC 20036, (202) 296-5098, pubs@cni.org.

Using Information Technology to Enhance Academic Productivity, by William F. Massy and Robert Zemsky, published by Educom, 1112 16th Street NW, Suite 600, Washington, DC 20036, (202) 872-4200, http://www.educom.edu.

The Coming Ubiquity of Information Technology...

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experienced the "technology transformation" of higher education?

Alas, it is still premature to talk about a technology-driven transformation, as academe is still in the early stages of adopting and incorporating various kinds of information technology into its instructional functions. And it is hyperbole to discuss a technological revolution, which implies a sudden and dramatic departure from past practice. Information technology, as a function and as a resource, has in fact entered the pedagogical mainstream. But IT has not radically transformed classrooms or the instructional activities of most faculty. The transformation, if it occurs, will take time, certainly another decade. Curriculum enhancement and innovation, however, will be a continuing and incremental process, remaining largely dependent on the interaction between individual initiative (the way individual faculty design the syllabus and structure their classes) and institutional infrastructure (the hardware, software, and support services available to students and faculty).

Unlike film and television—other once-heralded instructional technologies that many claimed would transform education and instruction—the demand for computing and information technology resources remains strong, is broad-based, and continues to expand: students often want and expect an IT component in their courses; growing numbers of faculty are using various kinds of information technology resources in their instructional and professional activities; and the institutional infrastructure necessary to support the effective and wide use of information technology continues to improve and expand despite the financial problems confronting individual institutions.

The emergence of IT as a curriculum component (or experience) is a significant innovation in higher education. The events of the past 15 years suggest a steady migration of information technology into instruction and other aspects of the learning experience. The arrival of desktop computing on college campuses fostered broad hopes and great aspirations for the eventual integration of computing and information technology into the curriculum. Technology in this context is not a goal or an outcome; rather it is an enabling resource intended to supplement, enhance, and extend the learning experience. The potential of technology to provide new tools and information resources has long been the great expectation that fueled institutional investments and individual experimentation; the potential and the possibilities remain as appropriate and attainable goals. ■

***Editor's note**: Copies of The 1995 National Survey of Desktop Computing in Higher Education are $35, prepaid, and can be ordered from Campus Computing, P.O. Box 261242, Encino, CA 91426; (818) 990-2212; cgreen@earthlink.net.*

"Unless the First Amendment is deemed to apply to electronic speech, granting it at least the same tolerance as we grant to books, its usefulness for education, research, and scholarly communication will be doomed.... What a tragedy that would be, and how out of step...with the rhetoric of the politicians who proclaim the dawn of a new computer era, yet who passed this (The Communications Decency Act) legislation."

Fred W. Weingarten
American Library Association
"Uncle Sam as Internet Nanny"
Chronicle of Higher Education
March 1, 1996

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In Future Issues

- *Another look at IT outsourcing*
- *Refocusing the IT department: from technology to customer service*
- *New system implementation: basic guidelines for success*

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EDUTECH RESPONDS

Q. We're just beginning a needs analysis to determine our choice of a new administrative information system. What we need to know is how to strike the right balance between being overly optimistic and having unrealistic expectations, on one hand, and being too limited in our thinking, driven by how we are doing our jobs now, on the other.

A. *Not an easy balance, to be sure. One of the key issues is to become as educated as possible about different options, both in terms of what other institutions are doing and what the vendors are offering in this area. Talking with colleague-counterparts, attending conferences, and doing a lot of reading are all good ways to stay up to date and realistic about the various possibilities. In addition, involving many people in the needs analysis, including support staff, department managers, faculty, students, and senior administrators, will increase the chances that the outcome will reflect a wide variety of perspectives. This kind of teamwork will guard against being too narrow in your approach. One thing to keep in mind is that the process of acquiring a new system is a great opportunity to look closely at existing procedures with an eye toward transforming institutional efficiency and effectiveness.*

Q. I don't think our IT department listens very well to us. As a faculty member who is heavily dependent on technology to teach my classes, I try to make my needs known to our IT people, but I'm just not getting through. How do I get their attention without being totally obnoxious about it?

A. *Most IT people have a strong service orientation and want to be helpful. If you feel your message isn't getting through to them about what you need, it may be that you need the louder volume that comes with additional voices. Chances are that you are not the only one on campus who feels as you do, and joining with others to express your concerns to the person in charge, or even forming an on-going committee, may make the difference. It often happens that due to limited resources, IT is trying to provide the maximum benefit for their services, so if they know that you are not just an individual with needs, but part of a larger group with many needs, they might be in a position to respond better.*

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THE EDUTECH REPORT

The Education Technology Newsletter for Faculty and Administrators

Should the Maytag Repairman Run Your Help Desk?

Howard Strauss, Princeton University

Back in the days when mainframes ruled the information technology landscape it was easy for college and university computer and technology groups to understand what business they were in; they were in the mainframe business, of course. Today it is much less clear. Are they in the PC business, the network business, the Internet business, the intranet business, the Java business, or the keeping-up-with-technology business? Most of us know that the answer is none of those. In fact, even in those Big Iron days of yore, we were never in the mainframe business. Like today, we were in the service business, the only business we can possibly be in if our goal is to meet our users' needs.

Even when computers were large finicky monoliths that required chilled water for cooling, raised floors for interconnection of modules, and a dedicated priesthood of systems programmers and systems engineers to keep the large beasts breathing, the necessity of being in the service business was well understood. The most obvious manifestation of that understanding was the proliferation of User Services groups. Those groups, now largely replaced by more modern offspring, were dedicated to helping users make effective use of computing. In many cases, they were computer user advocates, doing battle on behalf of users with the operators, systems programmers, and other user-hostile or user-indifferent computer center denizens. In part, because mainframes were so complex, their software so primitive, and the computer center gurus so technical that they shared no common language with users, it was essential to have a User Services group mediate between the users and keepers of the mainframes.

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"[Electronic mail] may well be the 'killer ap' that provides the compelling rationale mainstreamers need to begin experimentation in their own right, for teaching and learning are interactive processes that occur between people. Electronic mail can extend and amplify traditional instructor-to-student and student-to-student interactions in significant ways that add value easily recognized by the most reticent of faculty. Only a small leap remains for an instructor familiar with electronic mail to begin to tap into the resources available on the World Wide Web."

Larry Johnson
League for Innovation in
the Community College
"In Response"
Change
March/April 1996

NEWSBRIEFS

DISTANCE ED MASTER'S DEGREE IN INFORMATION RESOURCE MANAGEMENT

Syracuse University's Independent Study Program leading to the degree of Master of Science in Information Resources Management (IRM) is a newly created program in response to strong demand by students who are unable to spend two years in residence. The on-campus IRM program was founded in 1980 and was the first information resources management program in the U.S. The distance-learning-based independent study program is interdisciplinary in nature and draws on the expertise of both full-time and adjunct faculty with backgrounds in strategic management of information resources, electronic commerce, communication, information science, computer science, business, and telecommunications. The curriculum is designed to provide students with a broad range of skills and knowledge in information systems; information management; information users; information and communication technologies; information industry and services; information policy; and appropriate research methodology.

For more information, contact Syracuse program representatives at (315) 443-2911; ist@syr.edu; http://istweb.syr.edu/.

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The pamphlet is available by contacting Bonnie Dunn, CSU Chancellor's Office, P.O. Box 3842, Seal Beach, California 90740; or see the CETUS home page at http://www.cetus.org. The home page also contains links to fair-use guidelines and other resources that are intended to promote a fuller understanding and appreciation of copyright laws.

SCHOLARS FOUNDATION AWARDS ITS 500TH SCHOLARSHIP

Datatel, Inc., a major provider of higher education administrative software systems, has, through the Datatel Scholars Foundation, awarded its 500th scholarship and has now surpassed $500,000 in total awards. First established in 1990, the program awards scholarships to students at Datatel client institutions. Interested students apply through their own Financial Aid offices, with selection criteria based on personal motivation, academic merit, external activities, and letters of recommendation.

For more information, contact Jane Roth, Executive Director of the Datatel Scholars Foundation, 4375 Fair Lakes Court, Fairfax, Virginia 22033; (703) 968-9000; scholars@datatel.com.

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The Four E's of Being a Higher Ed CIO

Being a CIO in higher education is not easy, especially these days. Consider the typical college or university today: increasing demand for information technology services as both the number of users and the range of activities that each user wants to engage in increases; a widening gap between that demand and the supply of information technology products and services; top-level confusion about how best to organize IT services (combined administrative/academic or separate? with the library or without? telephone lumped in with networking or not?); advisory and policy committees with ambiguous roles and authority; and an overburdened and under-appreciated staff. It's enough to make any CIO, even those with many years of experience, question how best to get a grip on it all.

One way to cope is to recognize that no single individual can do everything, and to set one's priorities according to what is most needed by the institution. In this time of turmoil and great consternation, most colleges and universities need their CIOs to play four major roles: Envisioner, Educator, Enthusiast, and Executor.

The **Envisioner** is the one who provides the answers to the questions: Where is this all going? and Why is it important? This role requires a forward-thinking, bold, imaginative person who can see—and clearly express—the potential that information technology has to transform the very nature of higher education.

The CIO who is making presentations to the Board of Trustees and the Cabinet on universal connectivity, libraries without walls, and a one-to-one ratio of people to computers is an Envisioner. The CIO who is writing about what his or her institution needs to look like in the next century is an Envisioner. The CIO who sees the full extent of what an excellent administrative information system can do for the campus over the next ten years is an Envisioner.

The most important skill of an Envisioner is to be able to look beyond the current boundaries, whether they are political, financial, or operational in nature, and see what is possible. This role demands that the CIO not become discouraged by the limitations of current circumstances, but remain optimistic that change is both possible and desirable, and, if the institution is to survive, absolutely necessary.

In this time of turmoil and great consternation, most colleges and universities need their CIOs to play four major roles: Envisioner, Educator, Enthusiast, and Executor.

In the role of **Educator**, the CIO helps his or her institutional colleagues to understand all of this. Often overwhelmed by the pace of technological change, the terminology, or the costs involved, institutional decision-makers can become literally paralyzed, risking the ability of the institution to stay up-to-date and on course with technology. The CIO has to bring this whole situation into understandable terms for non-technologists, help remove the fear and anxiety, and constantly promote the idea that this area is, after all, manageable.

In the role of Educator, the CIO helps makes sense of information technology by demonstrating the ways in which it contributes to the institution relative to its costs, how it can be planned for and budgeted for in reasonable ways, and how it is not so very different from other institutional resources.

The most important skill of an Educator is communicating, both verbally and in writing. The ability to get one's point across clearly, the patience to keep trying many times over and in a variety of ways, and the humility to understand and appreciate that even though these folks don't know as much as you do about technology, they are, nevertheless, highly educated, generally thoughtful and intelligent people are the characteristics of the effective Educator.

The **Enthusiast** is the one who keeps everything on a positive note. In this role, also known as the Evangelist, the CIO encourages faculty to use technology in their classrooms, shows the president how to use e-mail, and helps clerical staff see that using the new computer system will not risk their job security.

Unfortunately, many CIOs have stopped playing this role, concerned that everyone on campus is already enthusiastic enough about technology and that by continuing to promote technology, the CIO is just adding to the demand level. While to some extent this is true, many folks who need to be on board are not as yet, particularly among the faculty and the top administration. Plenty of encourage-

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Should the Maytag Repairman Run Your Help Desk?...

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Over time, as our dependence on mainframes ebbed and new distributed technologies and paradigms emerged, these groups were replaced by Information Centers, and later by the Help Desks of today. The reasoning was that new technologies obviously required new organizational structures to manage them. But if we really understood that we were always in the service business, not the technology business, then all that had changed was some hardware and software. Our basic mission hadn't changed at all. What our users needed to manage the changing technology was lots of TLC and more user services, not some new structure that actually gave them less service.

Help!

At first glance a "good" help desk seems to have everything a user needs. There's the easy-to-remember help desk number that is something like GET-HELP (438-4357). Once you call the help desk your problem is typically logged in a database. This ensures that the help desk has ownership of your problem and that it will be followed up until it is solved. Logging your call also gives the help desk ways to generate statistics that will be used to assess its level of service.

Before attempting to solve your problem, the help desk will check its database of problems to see if the problem—or one like it—has ever been solved before. If it has, the problem and the answer will be in the database, and you'll get a near instantaneous solution to your problem. If the help desk database software is sophisticated enough to employ expert systems, then similar problems will generate hits making the help desk system easier to use and increasing the probability of getting a hit for a problem. If the problem can't be found in the database, it will be added, along with its solution when the problem is solved. Thus, the next person to have your problem will get a very quick solution.

This seems to be great for users. Their problems get solved in the most expedient way possible. It's also great for the people who run the help desk. They get to use neat software, and unlike for many technology services jobs, success is easy to measure. Just how is that done?

> *The Maytag repairman measures success by how infrequently his phone rings. This is just the opposite of how a help desk measures success.*

Sweet Success

The help desk exists to help users solve problems. The more problems logged in the help desk databases, the more effective they imagine they are. To be efficient, they need to build up their problem database so that the probability of finding the problem of the next caller is very high. They also need to get lots of hits from each item in the database. If a user has a problem and no one else ever has it, it is almost a waste of time to have added it to the help desk database. But if a problem recurs a hundred times, then the usefulness of that database item is a hundredfold greater. And of course the faster a problem is solved, the better for the user—and the more success points awarded to the help desk for dispatching the problem quickly.

If this were the way the Maytag repairman measured success, no one would buy a Maytag washing machine. The Maytag repairman measures success by how infrequently his phone rings. This is just the opposite of how a help desk measures success. If the Maytag repairman's phone rings, it means that Maytag has failed one of its users. Is a user with a load of sopping wet, soiled clothes in a washing machine that won't wash happy to know that by dialing an easy-to-remember number he or she will be connected to the Maytag help desk where they have the most sophisticated software with which to log the problem? Will it make the frazzled user feel especially good to know that he is the hundredth person to have the very same problem and that he will be told in just a few microseconds after he describes the problem that the washing machine's veeblefetzer needs an adjustment that can be scheduled for any time next week and will not cost more than $200?

Any time a user of a washing machine, a text processor, or a network has to call for help, the system has failed that user. Whenever your help desk phone rings, there is an unhappy user calling to report a failure of your information technology group. Yet the help desk measures success by how many unhappy users report difficulties in doing the things that your IT organization is charged with making easy. And the help desk rapidly solves the problem by quickly making the symptoms temporarily go away, not by solving the real problem. Solving the real problem would take too long and

Howard Strauss is Manager of Advanced Applications at Princeton University.

might require real changes in the IT organization itself.

The real problem might be that your documentation is too difficult to understand, your systems are too hard to use, your mini-courses are off the mark, your network is too slow or too unreliable, your systems analysis is anemic, or that you have let a user down in any one of hundreds of other ways. Solving the real problem might require that you rein in your systems programmers, that you reorganize, and that you struggle to view the world from your users' perspective. How much easier it is to just tell a user the twelve steps to solve the problem than to discover how to make it so that the problem never recurs.

Once a user calls, it is too late to make her happy. The only way to make a user happy is to ensure that she never has any reason to call the help desk. The help desk can make the user even more unhappy by handling her problem badly, but it cannot give her back the time she lost, nor can it undo the agony she experienced in bumping into a problem that the peers of the help desk should have anticipated and prevented from occurring in the first place.

If the help desk measured its success as it should, it would be alarmed every time its phone rang. If the same item appeared even a few times in its database it would be horrified. That would be an indication of a systematic problem that would inevitably affect other users. Why have a group that exalts in a growing list of system and management flaws (which is what the help desk database consists of) and feels pride in watching one user after another fall into the trap? The help desk solves problems *after* a user bumps into one. You need a group that solves problems *before* users bump into them.

The Big Sea

At Contented State University, known as "The Big C," the major computers are named for the major seas. Administrative computing is done on CASPIAN, while other computing is done on ADRIATIC, DEAD, RED, SALTON, and others. The Novell servers are called the Seven C's and of course all start with the letter College In cases where the names are longer than eight characters, the systems programmers have used easy abbreviations—cabiri, caduceus, caelian, calliope, cssiopia, chihuaha, chryseis, and circe. Although there are now eight servers and will soon be more, they are still called the seven C's. In keeping with this theme, each disk on each server is named for a fish.

Once a user calls, it is too late to make her happy. The only way to make a user happy is to ensure that she never has any reason to call the help desk.

A user at The Big C recently called the help desk because he couldn't figure out how to install the latest version of a sound player for use with the Web. Since this is a very common problem at The Big C, the answer was in the help desk database and he was quickly told to copy the chorus.zip file from the Novell server, unzip it, run the installer, and he would be all set. Another satisfied customer for the help desk, and the problem was resolved in just 94 seconds!

But the user called back, saying he couldn't figure out which server to use. A quick check of the database revealed it was on "chihuaha," so the help desk specialist answered, "It's on chihuahua" and added another satisfied customer to her list, in just 72 seconds. The next time the user called, the help desk explained how "chihuahua" was abbreviated to eight characters by leaving off the last "u" and that the software was on disk "pickerel." At the next call, it told the user how to unzip the application and how to install it. It never did get around to asking the user why he needed the sound player, or asking if the one that is already installed on every lab machine would do.

The problem is that no matter how quickly the help desk solves a user's problem, it rarely gets remotely near the real problem. In this case, giving servers cute, ingenious, but impossible to spell or remember names is one of the real problems. If the software that the user needed was on a server named "software" and if that server had only one disk, then the help desk phone would not ring as much. If all applications were stored as installers that users only needed to copy and start up, that would also solve part of the problem.

The help desk asks, "What is your problem," and then tries to solve it. To really do users any good, someone should ask, "Why did this user have this problem and how can we make sure no one else ever has it?" But it would be even better to have asked that question before anyone had the problem. The help desk can't do that. It enters the picture much too late—after a problem appears.

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The help desk is a way of documenting a problem rather than solving it. A car I used to own would chirp at me if I left my headlights on, but I'd get used to the chirping and leave them on anyway. The car documented the problem without solving it. My current car turns the lights off for me. The engineers who built it realized that once they understood the problem (people leave their lights on causing their batteries to go dead), they could ignore it, warn me about it, or solve it. Those are the same choices an IT group has. While documenting a problem is better than ignoring it, we delude ourselves if we think a big sign, or big database that documents where the potholes are, makes the road smooth and safe to travel on.

Help For The Help Desk ——— You must work to put the help desk out of business. To do that you need a group whose focus is making it so that users never have any need to call a help desk. Sure, users will have problems no matter what you do, and you'll need to handle them after the fact. But that will not be your main focus. Your main focus will be to make problems as rare as you can by eliminating their source.

The group needed would control all aspects of user services and support. An appropriate name for it might be the User Services Group (USG). The USG would manage documentation, education done by others in the IT organization, public computers, and any interface that users have with software, hardware, or IT itself. The group would cut across academic, administrative, and student computing and would be an important force in deciding what software to make available (yes, even operating systems), the timing of new releases, and would actively do programming in support of making technology easier for users.

All these areas might not be part of the USG, but the USG would have an important vote in all those matters. The USG would change the way you deal with your users from being reactive to being proactive. Instead of documenting what doesn't work, the USG would make things work.

For Whom The Phone Rings — Why does the help desk phone ring so much? Computers and information technology are new, difficult, and constantly changing stuff. To stop the phone from ringing, this difficult stuff must be tamed. It must be made easier and more familiar. The very first line of defense is to make the systems themselves easier to use.

Making systems easier starts with selecting them in the first place. Suppose your users wanted to build Web pages. (You'll note, I didn't say, "suppose you wanted your users to build Web pages.") You might let them use the Unix editor, suggest one of the many HTML editors, suggest they use the MS Word Internet assistant, or let them know about PageMill and FrontPage, two GUI HTML layout programs. If they use some basic editor you will get zillions of calls about every HTML nuance. Your help desk database will accumulate a wealth of common ways to abuse HTML. You'll have the joy of teaching dozens of sections of "Introduction to HTML," "Intermediate HTML," "Advanced HTML," and "HTML for Aliens." Your documentation folks will be wrapped up documenting the latest features of HTML and warning users about HTML features only supported in the dreams of those that write HTML standards. Alternatively, you could choose software that would avoid all of this.

The Maytag Repairman ——— Most companies that make the best products have no help desk. They have no database of common problems because to stay in business they must eliminate them. They do have a database that tells them what products their users bought and anything else about their users that they can glean from those registration cards they urge you to fill in. Do you know what hardware and software your users use? Do you know as much about your users as Toyota, Maytag, Sony, or Microsoft knows about you if you use their products? Now that would be a database worth having. You could tell your users about the latest releases of just the products they have. You could give them tips and warnings that were always relevant to what they were doing. If they did call, you'd know if they were a Windows 95 user or a Unix user. You'd switch from reacting to users' problems to being a step ahead of them.

The Maytag repairman sits by a phone covered with cobwebs. Months go by without it ever ringing. If it should ever ring, all the resources of the company would be mobilized to make the user happy, and more important, to do whatever was necessary to ensure that the problem never recurred. We know the Maytag repairman is Madison Avenue fiction, but that fiction is the reality you want sitting at your help desk around the clock. You must give him or her the best tools, instantaneous access to information, and the highest priority support of the entire IT staff. Your users will be pleased to have the Maytag repairman run your help desk. They'll be even more pleased that you have made it unlikely that they'll ever need him. ■

The Four E's of Being a Higher Ed CIO...

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ment is still needed for many on campus to take the risks (not to mention the time and effort) of getting involved.

The most important skill of an Enthusiast is persuasiveness. The Enthusiast needs to make it clear to everyone (in the most helpful, supportive, and nicest way possible, of course) that resistance to technology is not acceptable at this institution, regardless of academic discipline, organizational level, or personal taste. The Enthusiast has to firmly believe, and be capable of convincing others, that technology will benefit every single person at the institution in one way or another, if not immediately, at least eventually.

The fourth role, that of **Executor**, is actually the most important role of all. This is the role in which the CIO makes the promise of information technology become the reality; where all of the envisioning, educating, and enthusiasm pays off by putting the institution in the best possible position to use technology effectively.

The Executor makes sure that when a faculty member uses the Internet for the first time in a presentation to a large class, it works just the way it's supposed to. The Executor makes sure that when the VP of finance uses e-mail to send a fully formatted attachment to the president to use at the next planning meeting, what is received is exactly what was sent. The Executor makes sure that 100% uptime is a realistic, achievable goal, and routinely fulfilled. The Executor creates a stable, reliable, and dependable information technology environment for everyone across the entire campus.

The most important skills for the Executor are the traditional management ones: planning, evaluating, organizing, and getting things done through other people. The Executor is the primary manager of the institution's information technology resources and staff, and as such, brings these resources to bear directly in support of the institution's goals and objectives. The CIO thus balances efficiency and effectiveness by ensuring that all possible operational efficiencies are achieved while at the same time, the whole IT organization is working together effectively.

All four roles are needed, and each must be in a balance appropriate to the institution. Some institutions will need more emphasis on one role than another, but acquiring and developing the right skills for all four roles will ensure a CIO's success. ■

"Many academic leaders believe that all revenue sources are already working at full capacity and that a net increase in budget for educational uses of information technology must be offset by decreases elsewhere. On campuses where budget cuts have been common in recent years, this will be a painful process and one difficult to justify. That pain can be reduced or mitigated by engaging representatives of widely diverse stakeholder groups within the institution in deliberations focused on the teaching/learning gains that appear increasingly to be within the reach of technology, and on the competitive pressures from peer institutions."

Steven W. Gilbert
American Association for Higher Education
"Making the Most of a Slow Revolution"
Change
March/April 1996

In Future Issues

- *Managing the eccentrics in the higher ed IT organization*
- *Taking another look at the total-outsourcing option*
- *Models of behavior for IT professionals*

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EDUTECH RESPONDS

Q. We're facing a real dilemma here. Many of the departments and colleges at our university have set up their own public-access labs, using their own money (sometimes through grants) and staffing them with their own people. These are in addition to the labs that are administered through our central computer services group. The problem is that there is no consistency among the labs, and a student may go from place to place and not find the same equipment, software, or even printing capability, making it very confusing for them. How do we balance the need for a college or department to have specialized facilities and the need to provide the students with a uniform computing environment?

A. *There should be three kinds of labs on campus: generalized, run by computer services; specialized, run by departments or colleges; and joint ventures, run by both. Most of the labs should be in the first and third categories, and they are the ones where students should find the most consistency. The labs in the second category should be clearly designated as such so that students will not expect to find what is in other labs. Each lab, regardless of category, should record student usage, to make sure that predictions about which students will use which labs are correct, and so adjustments can be made if necessary.*

Q. We have third-generation administrative systems and cannot replace them at this time. However, one of the database vendors has offered us a large discount to acquire their database management system to "warehouse" our data, thus providing much greater opportunity for end-user querying and reporting. Then when we're ready to replace our applications systems, we'll be ahead. Is this sensible?

A. *Probably not. Usually, third-generation systems lack full data integration and often contain duplicate, but inconsistent, data. In addition, edits used in inputting data back then were typically not as sophisticated as they are today, resulting in less-than-clean data. This is what you'll be using to populate the data warehouse, making it a far less useful tool than you may be envisioning. In addition, when it comes time to choose a new application system, you don't want to limit your choices to only those that are already using this DBMS.*

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Questions to Ask About Your Administrative System

Is your campus contemplating a move to a new administrative information system? Does there seem to be some discontent among the users over missing functionality or hard-to-access data, or perhaps a growing realization that the technological foundation on which the current system is built will not last much longer? If you are trying to figure out whether to make a change, or how to justify a major investment in dollars, time, and energy in acquiring and implementing a new system, asking the major stakeholders the following questions may help.

Is there a very heavy reliance on paper to accomplish administrative tasks? For example, are requisitioning and purchasing largely paper-based? Does the creation of employee records during the hiring process use an excessive number of forms? Are there lots of paper-based transfers of information from office to office such as student withdrawal slips and travel authorizations? Are there multiple boxes of monthly financial reports on paper to send out each month to the campus?

Not only is paper costly, it contributes to an excess of manual processing and intervention in creating and communicating administrative information.

Is basic functionality in the system missing? Such things as degree audit, a full position control system, automated management of wait listing of classes during registration, a student's history of room assignments, a direct link between add/drops and financial aid eligibility, and a campus-wide calendaring system are examples of no-frills, basic items that ought to be part of every administrative system today. Gaps in functionality mean that people at the institution are doing what computers ought to

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"The increased awareness and the growth of computer and financial literacy across the institution are reshaping the roles and politics of the financial system design process. Financial information systems, in general, can no longer be developed exclusively through the bilateral agreement of the institution's chief financial officer and chief information technology officer. Under today's conditions, the support of these key decision-makers is likely to be a necessary but insufficient condition of project success."

"Introduction"
Campus Financial Systems for the Future
NACUBO and CAUSE
1996

NEWSBRIEFS

THE BEST PLACES TO WORK

Congratulations are in order for the **University of Miami**, the **University of Wisconsin at Stevens Point**, the **University of California at Davis**, **North Dakota State University at Fargo**, **Kansas State University**, the **University of Notre Dame**, **Bowling Green State University**, **Florida Atlantic University**, and the **University of Delaware**. The information technology department at each of these institutions made it into the *Computerworld* 1996 list of the 100 Best Places to Work. Each one is on the list because the IT department is considered exceptional in employment aspects such as diversity, progressiveness of policies with respect to internal communications, child care, flexible work schedules, and many other tangible and intangible criteria.

According to *Computerworld*, there are "a number of good reasons the university [IT department] is a good place to stay and build a career. The technology environment tends to be current, employees have broad responsibilities and a lot of freedom to make decisions, continuing education is supported and layoffs are rare."

DATA DEFINITIONS FOR COLLEGES AND UNIVERSITIES

Data Definitions for Colleges and Universities, by Charles Thomas, is now available. The first comprehensive information resource of this type in over twenty years, *Data Definitions* replaces the 1973 NCHEMS (National Center for Higher Education Management Systems) *Data Element Dictionary*. It provides an integrated set of official definitions, codes, categories, and descriptions for all of the standard data elements and examples for most of the unique data elements necessary for administrative information systems. It is meant to be a starting point for institutions that are constructing or modifying their information architecture.

Available on a single compact disk, this reference volume includes 780 individual data elements in six sections: Alumni/Development, Courses, Facilities, Finance, Human Resources, and Students. For more information, contact CHESS (Consortium for Higher Education Software Services), 1100 North Lake Shore Drive 16B, Chicago, Illinois 60611; (312) 951-1876; crt@cpua.it.luc.edu or see the hypertext demo on the NCHEMS home page at http://www.nchems.com.

TEACHING AND LEARNING IN CYBERSPACE

"Teaching and Learning in Cyberspace", a joint CAUSE/CNI (Coalition for Networked Information) conference hosted by Virginia Tech, will be held this September 12–13 in Roanoke, Virginia. The purpose of the conference is to explore ways that technology offers to improve the instructional environment, and will include sessions on networking infrastructure support, institutional policies, the economics of technology, and the challenges of distance education.

For more information, contact CAUSE at 4840 Pearl E. Circle, Suite 302E, Boulder, Colorado 80301; (303) 449-4430; conf@cause.colorado.edu.

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The Widening Gap

Students and Colleges With Ample Computer Access Find New Opportunities; Others Lag Behind

by Thomas J. DeLoughry

Technology will be the great equalizer in higher education, making lectures from Stanford and library materials from Yale accessible to students at the most remote community college in rural America.

At least that's the vision that many of technology's boosters have promoted for decades. But no one in higher education believes that the vision has been realized.

Institutions such as Harvard, Yale, Carnegie Mellon, and Stanford Universities are finding new ways of using computers, the Internet, and other technologies to improve teaching and research. But many more colleges are struggling to provide faculty members and students with the most fundamental services. For some, e-mail and access to the World Wide Web are things they've read about in newspapers and hope to have in three to five years.

Administrators at many community colleges, small church-related colleges, and other institutions that cater to low-income students say they're feeling pressure from students, parents, and potential employers to bring their campuses up to speed technologically. Many are pursuing grants, squeezing library budgets, and deferring maintenance to invest in new computers —a process that must be repeated every two or three years, because the machines have to be updated.

This article first appeared in the June 14 issue of The Chronicle of Higher Education, and is reprinted with permission. Thomas DeLoughry is a writer for the Chronicle; Goldie Blumenstyk contributed to the article as well.

"We're in the game, but we're in the low end of the game," says David L. Beckley, president of Rust College, a historically black institution that has used federal grants to buy many of the 400 computers available to its 61 faculty members and 1,200 students. "We know enough to know we want more."

Karl Wright, vice-president for academic affairs at Florida Memorial College, says his institution and some other black colleges face new demands for computing. "There's a groundswell of demand for it from faculty and students that didn't exist four years ago," he says.

> *For some, e-mail and access to the World Wide Web are things they've read about in newspapers and hope to have in three to five years.*

Florida Memorial has invested $1-million in computing in the past 18 months, pushing its total to 200 machines from 50. Most of them are located in public areas, where they are accessible to the college's 1,500 students and 71 faculty members. The college paid for it by using federal grants, cutting back on travel, and hiring fewer adjunct professors.

Within institutions, the growing importance of technology has also highlighted differences between the haves and have-nots.

Engineering and science departments often boast the newest machines—which are routinely handed down to humanities departments when new models are delivered. Students who can afford their own computers and printers find it easier to get their work done than do peers without machines, who often must wait in line at computer facilities at the end of the semester, when demand is greatest. Technology has also burdened students with new fees, either added to tuition bills or collected for individual services—among them laser printing, e-mail accounts, and at-home Internet access.

Those who study computer use in higher education say unequal access to technology mirrors the inequalities among institutions. "We will never have a perfect and equitable playing field, because there will always be institutions that have more," says Kenneth C. Green, a visiting scholar at the Claremont Graduate School who has studied computer use for six years. "The question is, Can we raise it to a *reasonable* common denominator of resources?"

Arthur Levine, president of Teacher's College at Columbia University, agrees that equality of resources will never be achieved. He suggests that existing differences among institutions are made worse by the expense of technology. "Some colleges can't compete at all, and those colleges are falling further behind than they ever were before," he says.

"Technology is going to be one of those transformative factors that are going to have an incredible

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Questions to Ask About Your Administrative Systems...

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be doing. When people do what computers ought to do, it almost always translates into additional labor, less accuracy, and less timeliness. The lack of needed features is a lost opportunity to improve the efficiency of the institution's operations and to provide better student service.

Are there many "shadow" systems? Especially for financial data (such as departmental budgets) and student data (such as lists of advisees), the existence of shadow systems indicate that the central administrative system is not meeting the needs of all its users. As more people want access to data they feel they need but can't get, for whatever reason, the more they will set up their own, department-based, systems for dealing with these needs.

These shadow systems mean that data is being collected and maintained redundantly. The more data is replicated, the more prone it is to error. The more effort people expend in collecting and maintaining replicated data, the more labor-intensive it becomes to run the institution. Neither of these outcomes is desirable. Furthermore, shadow systems lead to a situation in which the institution has to deal with different system architectures; different user interfaces; and different data definitions, formats, and locations, even when the data needs to cross systems. Worse, there is no single focus of responsibility for administrative systems planning, development, maintenance, or data accuracy.

Is the data suspect? When automated edits are not sufficiently embedded in the system at data entry time, it leads to data being in the system that people are suspicious of and find difficult to work with. For instance, let's say that the current data entry process requires that a home city be entered exactly as it is spelled (such as South New City), but the entry is not edited to make sure it is correct, leading to the inevitable collection of home-city data in the database spelled "So. New city," "south Newcity," "sth New cty," and so on. Not only does this show up badly when running labels or lists, it makes it virtually impossible to accurately count all the students whose home city is South New City.

> *Does there seem to be some discontent among the users over missing functionality or hard-to-access data, or perhaps a growing realization that the technological foundation on which the current system is built will not last much longer?*

Is the system not user-friendly? Especially, but not only, for intermittent users, the system needs to be as user-friendly as possible. Can records in the system be accessed only by a social security number? Do the users have yellow sticky notes all over their microcomputer or terminal screens because there is no on-line help? User-friendliness encompasses good documentation, minimal use of codes, a logical navigation system from screen to screen, on-line help, and an on-going training program.

Is there difficulty in integrating data across offices? Are there separate databases for person records, depending on the person's relationship to the institution? For instance, if a person is both an alum and an employee (a situation common in many institutions), will he or she have two records in the administrative system? Any task involving cross-departmental data, such as institutional research, is hindered by not having a fully integrated system that is free of duplicate data.

Especially with the need for good institutional research, a non-integrated system is a real impediment to a college or university trying to understand itself.

It would typically be very difficult, for instance, to answer such questions as, What does Course X cost the University to run? What effect does participation in student activities have on donation potential as an alumnus? What effect on classroom and laboratory utilization would an increase in enrollment in Biology have? What is the average undergraduate GPA for Chemistry majors who go on to successfully complete a doctorate and how does that compare to other majors? The answers to these questions are typically found by bringing together data from separate areas of an institution. With a system that is not integrated, however, rather than being able to do this easily through automated, integrated databases and an appropriate data retrieval and reporting tool, this sort of effort will be extremely labor-intensive, if possible at all.

Is there a lack of up-to-date administrative technology? Are you missing items such as a relational database management system, a fourth-generation programming language (as contrasted with the very labor-intensive COBOL language), a client/server architecture? Not only

does a lack of modern technology create problems, but it also means that there is no foundation for moving ahead with even more modern technology, such as document scanning and imaging, optical character recognition (OCR), kiosks, and a one-card system.

Is data access for querying and reporting unfriendly? Are there are high barriers to administrators, especially upper administrators, being able to retrieve the information kept in the system and to be able to display, print, or manipulate that information once retrieved? One of the outcomes of these barriers is to foster dependency on the Information Technology department to create new reports, rather than having them done where they clearly should be: in user offices. Although there may be a report generator available, it may be difficult to use and the data itself may be structured in such a way as to make it even more difficult.

The real payoff in an administrative information system comes when the top management of the institution begins to use it, especially for decision support purposes. Although it's important that the basic operations of the institution run well, when a president, the vice presidents, and the deans begin to really use the system themselves, the potential of all of that valuable information contributing to the decisions affecting the future of the institution can finally be realized. Insofar as this may be overly difficult to do when data access is unfriendly, it represents the waste of a very important opportunity.

Will the current set of systems be able to easily accommodate support for the new student services now being seen on many campuses? Many colleges and universities are using their administrative information systems to support new and expanded student services, such as prospective students being able to apply for admission through the World Wide Web, students using either on-campus kiosks or their own computers to access information about themselves, such as last semester's grades, this semester's class schedule, their financial aid status, or their advisor's office hours, and so on. These are just a few examples of the kinds of things being made available to students today, to help campuses create a more "student-friendly" environment. The information system needs to be flexible enough to accommodate these changes without major disruption and high costs.

Do the users have yellow sticky notes all over their microcomputer or terminal screens because there is no online help? User-friendliness includes good documentation and a minimal use of codes.

A word about intranets and data warehousing

There are many new ideas on the horizon that promise to make institutional data more accessible, and therefore, more useful. The possibility of building Web access to data kept in the current databases, for instance, or the idea of creating a data warehouse using a modern database management system are certainly techniques that deserve consideration. However, the fundamental piece of the information system—the part that creates the data to begin with and makes sure it is accurate and timely—must be rock solid in order for these techniques to work effectively. This is not the case at the moment for many institutions. In these cases, the institution's time and energy will be better spent on finding the right application-system foundation before it attempts to employ these new data access techniques.

Administrative technology is moving ahead very quickly; every institution needs to be in a position to exploit the best of what's available and to position itself to take advantage of new developments as they arise. The future requires a very different administrative technology environment than the ones that have come before; it will be characterized by distributed processing with client-server methodologies, fully integrated data, the use of graphical user interfaces, a single system image for all users, a very user-friendly approach, object-oriented programming, hardware independence, open systems, an eventual one-to-one ratio of people to equipment, universal connectivity, the need to serve diverse and multitudinous users with more user involvement and control, and less reliance on the traditional role of programmers to code applications in-house. Everyone on campus will be a user eventually, with the systems providing self-help; the users will not care where the processing or data is, as long as it is available on their desktops.

Your campus needs an excellent administrative information system. If you are in any doubt about the excellence of yours, ask yourself these questions. ■

The Widening Gap...

continued from page 3

sorting function in higher education," Mr. Levine says. Many of the poorest institutions will close their doors because they can't provide students with technology, and those that aren't as poor still may shut down, because other institutions will use distance-education techniques to rob them of students, he predicts. The institutions that survive will find money for technology by taking it from financial aid and other programs that serve needy students, he adds. "This one's a spiral in which there's no end in sight."

Some high-technology companies have sought to reduce the burden on selected institutions. Microsoft Corporation, for example, has donated more than $16-million in software and technical assistance to the United Negro College Fund and its members, and has worked with a consortium of federally financed Trio programs, which help disadvantaged students make the transition from high school to college. Other companies, such as Apple Computer Inc. and International Business Machines Corporation, also have offered discounted equipment to two-year colleges and historically black colleges.

But college officials say competition in the computer industry has made the discounts less generous than they were 10 years ago. Some colleges that bought machines under the programs have not been able to afford replacements.

Indeed, officials say, the recurring nature of computer expenses is the most vexing part of bringing a college up to speed technologically. "The biggest problem is with upgrading," says Martha McCloud, president of Bay Hills Community College. Her institution, which serves primarily American Indian students in a former fish-processing plant on Michigan's Upper Peninsula, has 60 computers for 500 students and 40 faculty members.

A few people at the community college have accounts with America Online, Ms. McCloud says, but buying more computers and connecting the campus to the Internet is too expensive to consider. "I don't know how we're going to get more," she says.

Bob Lawrence, president of Northwest Indian College, is similarly pessimistic about his chances of expanding computer access. "We could probably get a grant to install the networking, but those grants typically run one to two years at the most," he says. "How do we sustain that?"

> *Many of the poorest institutions will close their doors because they can't provide students with technology.*

On campuses where computers are integral to campus life, college officials say a gulf is developing between students who have machines and those who don't. "It's one more slap in the face for the poor kids that separates them from the haves," says Alan B. Parks, director of the Upward Bound program for at-risk high-school students at the University of Maine at Orono.

Maine does a good job of making machines available in labs, he says, but it's not the same as having your own. "It's still different when you've got your own computer in your own room, and at 3 o'clock in the morning you're doing a search on the ionization of hydrogen and someone else can't."

"The advantaged kids who have these resources are already a leg up," says Mr. Parks, who notes that lower-income students often have jobs during the day and must compete for seats in the computer center at night. "They can't get in there in the afternoon, when the thing is wide open and staffed."

They also suffer from not having been exposed to computers in their high schools, says Earl V. Farrow, an associate professor of education at Rutgers University and coordinator of academic-achievement and diversity programs on the New Brunswick campus. "There's an expectation that you're going to have a level of computer literacy when you get to the university," he says. "These students are coming in and falling behind from the very beginning if, in fact, the first class in art involves computer art."

Rutgers financed new computer laboratories around campus with a $50-per-semester fee, which has the greatest impact on the neediest students, notes Mr. Farrow. Many students at Rutgers opposed the fee when it was approved in 1993, as have students at other institutions where such fees have been proposed or increased, Among the latest to announce new fees is the University of California at Berkeley, which has instituted a charge of $10 per semester for students who use university-owned printers. In addition, the university is directing students who want off-campus access to the Internet to open accounts for $9.95 a month with Netcom On-Line Communications Services Inc. of San Jose, Cal.

The University of Florida, meanwhile, instituted an e-mail fee in

February for students who are using the campus network on their own rather than at the direction of a professor. Free accounts are still available to those who use the network as part of class activities, but others must pay $20 every four months.

On other campuses, the issue of fees takes a back seat to questions of access. Many community colleges and four-year colleges serving commuter students are struggling to provide network access to students who may be on the campus only three or four hours a day. Some officials say they are looking forward to the day when cable-television and telephone companies put low-cost, Internet-capable computers into homes as part of their regular service. Other institutions are exploring how they can make computers available to students at affordable prices today.

John D. Sorenson, vice-president for academic affairs and dean at Waldorf College, says affordability was a prime concern in his institution's decision to require every student to have a laptop computer this fall. In an effort to minimize the expense, the college will lease the machines to students. The cost of the lease will be part of a $600 tuition increase that Waldorf has announced for the fall.

Richard A. Skinner, president of Clayton State College, is also looking to laptops as a way of getting computers in the hands of students, many of whom are working mothers who commute to campus. "If you don't do that, the have-and-have-not phenomenon just exacerbates very rapidly," he says. Needy students will never benefit from on-line services—among them Galileo, a new library network linking Clayton and other Georgia colleges—if using them means spending hours in a computer center or library, he says.

Cost is a major obstacle, Mr. Skinner acknowledges. He hopes to cooperate with nearby Floyd College, a two-year institution, to negotiate a bulk purchase from a computer manufacturer. He's also talking to local banks about their subsidizing the purchase so that students have to pay only $35 a month to lease a machine. Banks will be interested, he says, if the computer is equipped with software to do electronic banking or filing student-loan applications through the bank.

Experts in college computing say all institutions—rich and poor—will have to open themselves up to such innovative thinking in the future. Campuses that work cooperatively with computer manufacturers, software publishers, and providers of Internet and video-conferencing services are going to get the most bang for their buck, experts say. Richer institutions are more likely to have the name recognition and staff members to succeed in landing corporate partnerships, says Martin Ringle, director of computing and information services at Reed College and a consultant in college computing. To benefit from these partnerships, he says, less-affluent colleges would be wise to form consortia with larger institutions in their areas. "I think that is probably the best bet that everyone has." ■

"There are several approaches to planning for the deployment of a technology infrastructure. The laissez faire theory employs no plan to guide the development or implementation of the infrastructure. There is no framework to guide the growth of the infrastructure or measure its effectiveness and benefits. The laissez faire strategy for technology transfer is alive and well in higher education."

Mark Siegel
University of the District of Columbia
AAHESGIT Listserv
June 1996

In Future Issues

- *When doing strategic planning for IT is not a good idea*
- *What, if anything, IT has to do with institutional quality*
- *New system implementation: basic guidelines for success*

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EDUTECH RESPONDS

Q. We're interested in the possibility of using the World Wide Web to make administrative data available to our end users. Would this be a sensible approach?

A. *Absolutely. With the advent of the World Wide Web, information access and distribution has taken on a whole new meaning. The only major requirement (besides a network connection, of course) is that the desired information be on a computer somewhere that has a connection to the Internet and that the person who wants access has a microcomputer with a Web browser. Graphics of all kinds, including photographs, can be shared as easily as text. Charts and graphs are no problem. Highly formatted documents can be read in their original form. Links can be easily created to access related data. It no longer matters whether the person who wants access has a Macintosh or a PC on his or her desktop; it no longer matters which administrative system created the data or what mainframe it runs on. The Web, still a relatively new phenomenon, has already meant that barriers to information and information access are dropping more and more every day.*

Q. Our institution has three separate campuses, each with its own administration, faculty, and student body, but with a need to share information among us. We're all looking for new administrative systems, but we're on different schedules for making our decisions. Do we all have to have the same system in order to share information?

A. *Not really. As long as each campus chooses an applications system built on a modern and mainstream technological foundation (which they would very likely do in any case), then whether the systems are the same or different will not have an effect on sharing data, except in minimal ways. (Data formats, for instance, are less likely to be the same in different systems; on the other hand, data formats can vary greatly among institutions using the same system.) Two circumstances will promote sharing from a technological point of view: 1) modern systems have a lot of built-in flexibility so that data can be accessed in a much wider variety of ways than in older systems; and 2) the advent of the World Wide Web has allowed us to not care as much anymore about compatibility among platforms, systems, and data formats.*

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The Productivity Paradox, Revisited

Judith Brodnicki, University of Nebraska

I read with amusement a recent article in this publication entitled "The Productivity Paradox." The author, Paul Attewell, who has written an entire book on this subject, concluded that the use of computers in the office has diminished office productivity despite the fact that these systems have been acquired for the purpose of improving the work flow. He wrote that people hired in professional-level positions (i.e., faculty and administrators at colleges and universities) are spending too much time making their documents look "elegant," and that they are spending a lot of time at home creating spreadsheets to justify the cost of more computers. Furthermore, he suggested that the only instances in which productivity was improved was when a secretary was on staff to answer the telephone and therefore quell numerous interruptions.

Naturally, I shared this with the other secretaries I work with, and we had a good laugh. We concluded that the author lives in some kind of science-fiction time warp in which faculty and administrators actually have time to use their computers for these purposes, and secretaries function only as human answering machines.

Granted, there is a problem when departments spend money on computer systems without having a plan of how the system will work and what it will accomplish. But there's an even bigger problem when you try to blame the computer for your inability to exercise control over your resources of time and people.

Here are some examples of productivity problems other secretaries and I have encountered on a regular basis:

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"Schools are very likely the last line of defense in the global trivialization of knowledge—yet it appears that they have not yet learned enough about the new technologies and media to make the important distinctions between formal but meaningless activities with computers and networks, and the fluencies needed for real 21st century thinking. At their best, schools are research centers for finding out interesting things, and like great research centers, these findings are best done with colleagues. There will always be a reason to have such learning centers, but the biggest problem is that most schools today are not even close to being the kinds of learning centers needed for the 21st century."

Alan Kay
"Revealing the Elephant"
Educom Review
July/August 1996

NEWSBRIEFS

NOW THERE'S GROUPSOURCING

The Corporation for Research & Educational Networking (CREN) has developed a variety of ways for colleges and universities to use collaborative tools and services to make the transition to the Internet. The efforts by CREN are based on assisting higher education institutions to take advantage of new Internet-based tools for research and education at the best possible prices through "groupsourcing." Services include Be-In-Touch-NET for remote connectivity, ListProc list management software to replace mainframe-based listservers, VoxWare's ToolVox for Internet voice communication, and Mainframe-on-a-card to provide VM-based software that enables PCs to work with legacy systems housed on IBM mainframes.

For more information, contact CREN at 1112 16th Street, NW, Suite 600, Washington, DC 20036; (202) 872-4200; cren@cren.net; http://www.cren.net.

THE MUST-ATTEND CONFERENCES

As the summer season dwindles, thoughts turn to the annual fall conferences for Educom and CAUSE. The Educom conference, "Information Technology: Transcending Traditional Boundaries," will be held this year in Philadelphia on October 8–11 and is being hosted by the University of Pennsylvania. Sessions will explore various aspects of how information technology now supports, and can in the future enhance, teaching and learning opportunities beyond the traditional limits of classrooms, geography, the calendar, accessibility, and culture.

The CAUSE conference, "Broadening Our Horizons: Information, Services, Technology," will be held in San Francisco on December 3–6. Topics include policies and standards; IT organizations and strategic partnerships; customer-centered services; distributed computing and network technologies; innovations in technology; the learning organization; networked information; and teaching, learning, new media, and the Web.

Both conferences will feature pre-conference seminars, poster sessions, vendor participation, and constituent group meetings. For more information, visit the Web sites at http://educom.edu and http://cause-www.colorado.edu or contact Educom at (202) 872-4200 and CAUSE at (303) 449-4430.

TEACHING AND LEARNING IN CYBERSPACE

"Teaching and Learning in Cyberspace" is the theme of a conference sponsored by CAUSE and the Coalition for Networked Information (CNI) this September 12–13 in Roanoke, Virginia. Sessions will focus on networking infrastructure support for higher education; transformation of the teaching and learning environment; institutional policies for cyberspace; scholarly communication and publication in the networked environment; administrative applications on the network; the economics of technology in higher education; and the challenges of distance education.

For more information, contact CAUSE at 4840 Pearl East Circle, Suite 302E, Boulder, Colorado 80301; (303) 449-4430; info@cause.colorado.edu.

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The Productivity Paradox, Revisited...

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• People with powerful (or even adequate) computers at their desks who still write out everything by hand, give it to the secretary to type/word process, and then micromanage the project to its completion.

• People who call the secretary (sometimes every five minutes) with a question on how to do something (whether it is about the computer or something else). They don't write the answer down; they just call again when they need the information.

• People who have electronic communications (e-mail, file transfer protocols) at their fingertips, but bring a printed document down the hall and into the office so the secretary—who may be working on a project with a hot deadline—can stop working to photocopy this communiqué and distribute it to everyone else.

The problems are obvious—especially to the support staff members who are charged with the job of organizing the myriad tasks that come into the office—but the answers are not so easy to identify, especially in a college or university setting where the demands on everyone's time and resources are growing daily.

Financial resources are almost always at low tide. That doesn't exactly produce an environment conducive to long-range planning for expensive items such as computer systems. Budgets that are dependent on state economies and course enrollments can change drastically from year to year. Also, computer hardware and software are changing so rapidly that even a three-year plan for purchasing can be obsolete in six months.

Additionally, time resources are practically nil for all of us. Administrators and managerial/professional-level staff members—unless their position specifically requires the use of a computer—rarely have time to use the time-saving equipment in the office because they are so often taken up with other responsibilities related to running their unit. Among other things, there are monthly faculty meetings, staff meetings, executive committee meetings, and ad hoc committee meetings that require preparation and attendance.

> *There's a big problem when you try to blame the computer for your inability to exercise control over your resources of time and people.*

In addition, students, faculty, and staff require individual meetings at times, and on top of all of that there are a lot of numbers to keep track of: operating budgets, personnel budgets, recruitment and retention figures, enrollment figures, enrollment comparisons over time, alumni placement statistics, *ad nauseam*.

Where faculty members are concerned—particularly the ones in tenure-track positions—the list of responsibilities is exhausting: prepare for classes; teach classes; advise students; meet with students having problems in class; stay current in professional area of expertise; continue to do research in professional area of expertise; write and submit articles based on research and current trends; serve on various campus committees; maintain membership in professional organizations; attend professional seminars; apply for grants; develop interdisciplinary research projects; and participate in outreach opportunities. And don't forget that in addition to the above, we still have to do laundry, clean the kitchen, take out the garbage, fix supper, take the dog to the vet, and drive the kids to soccer practice.

And Attewell is blaming computers because we're not getting enough done.

In my opinion, we aren't going to be able to solve productivity problems with five-year plans and time-management seminars. And we aren't going to solve it with a completely new and up-to-date computer system either. It's going to take some daredevil courage and radical changes in the way things are done if we really want to become more productive.

For example:

Debunk the myth of "open door" policies and replace it with a realistic approach to time and how it is expended. This is the most important step to accomplishing any other goals. All the computers in the world can't help you or your institution if your time is overly constrained. There has to be time to learn, there has to be time to work, and there has to be time to interact with others.

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At the time of writing this article, Judith A. Brodnicki was a Staff Secretary in the College of Human Resources & Family Sciences at the University of Nebraska. She has since moved to a similar position in International Studies.

Democracy and Decency on the Internet

by Richard A. Detweiler

The decision of a special panel of federal judges in Philadelphia last month, setting aside the Internet-censorship provisions of the Communications Decency Act, is not the last word in the debate over whether access to information on the Internet should be limited. An appeal to the Supreme Court seems likely. And even if the highest court supports the panel, the architects of the C.D.A. have said they will introduce a new version of these provisions in Congress. Since the debate is not yet over, colleges and universities should consider whether they need to revise their policies about the information they make available on the Internet, and about their students' access to the network.

The C.D.A. is part of the Telecommunications Act of 1996, passed by Congress in February. It states that any person who "makes, creates, or solicits" or "initiates the transmission of any comment, request, suggestion, proposal, image, or other communication which is obscene or indecent, knowing that the recipient of the communication is under 18 years of age, shall be criminally fined or imprisoned." Further, it states that it is a crime to use an interactive computer service to send or display to a person under age 18 "any comment, request, suggestion, proposal, image, or other communication that, in context, depicts or describes, in terms patently offensive as measured by contemporary community standards, sexual or excretory activities or organs, regardless of whether the user of such service placed the call or initiated the communication."

The legality of these provisions was challenged by the American Civil Liberties Union, the American Library Association, and others, citing First Amendment protection of speech. The special panel of three federal judges agreed with the plaintiffs, holding that "the Internet deserves the highest protection from government intrusion."

A growing number of private citizens and politicians worry that changes in society are eroding traditional values, a trend they claim is demonstrated by a prevalence of pornography. From their perspective, the Internet is the latest and grossest violator of moral standards to appear. And it appears not on some sleazy back street, but right in the home of every American with a phone line and a computer. As such, they say, it should be regulated just as porn shops and broadcast media are.

But is the Internet like a store or a television station? In fact, the Internet is nothing more than a network, a system that connects one computer with another. The ability to make these connections is not new. What is new is the ease with which one computer can be connected with another computer on the network. Because of this, two wonderful things happened. First, creative thinkers invented software that lets even technologically unsophisticated people send words, sounds, and pictures through the Internet. Second, entrepreneurs are offering inexpensive Internet connections to nearly everyone. For a relatively small investment, anyone can communicate.

Thus, the Internet is unlike television or radio, which give only the few organizations that purchase licenses and that invest in expensive production and broadcast facilities the ability to send messages or provide information. Nor is the Internet like a porn shop: no Internet user must go past a particular service on the network, and services do not attract unwanted people to a user's neighborhood.

The Internet, in some sense, recreates the street corner of 1776, with almost everybody having the opportunity to express ideas, provide information and services, or discuss crucial issues of the day. But it is also an improvement on that street corner in several ways: Only those who choose to look and listen can see and hear, so people can avoid unwelcome material; it connects people to others around the world, not just to those nearby; and it provides information and services 24 hours a day, seven days a week.

From this description, the First Amendment status of the Internet seems clear. In fact, the Internet is the ultimate tool of democracy, making speech and ideas freely available. As a mechanism for communication, it should be protected from censorship.

It is important to recognize that the A.C.L.U. and other plaintiffs did not question whether federal or local governments can regulate obscenity or child pornography. Such statutes already exist. And the panel of judges acknowledged that parents can use currently available software to limit what Internet services their children can gain access to. However, the judges ruled that the C.D.A. unconstitutionally limited freedom of speech, by essentially requiring that all communication on the Internet be appropriate for children.

While the courts address the legal challenges to the C.D.A., what should colleges and universities do?

First, all of us in higher education should understand how important it is that the Internet be free from censorship—and not just because colleges could be liable for the actions of students who might create offensive home pages. The provisions of the C.D.A. would have banned much of medicine, art, and literature from the Internet. Beyond that, the prohibition of material that is "patently offensive as measured by contemporary community standards" cuts a very broad swath. A fundamental premise of a liberal-arts education is that no individual or group should be allowed to decide what information others can have; this is equally the core of academic freedom. The Internet is the ultimate tool of education, as well as of democracy.

As educators, we have a responsibility to make sure the public understands that the Internet is used in many ways, and that it is not possible to separate the uses into distinct categories. Material that may be "offensive" in one context can be educational in another. We should clearly state that we oppose behavior on the Internet that is illegal. But we must direct child-protection efforts away from legislative solutions and into the home. The responsibility to control children's use of the Internet belongs to parents.

Second, we should look carefully at our institutional policies regarding the use of the Internet and computers that can gain access to the network. The C.D.A. states: "No person shall be held to have violated... [this act] solely for providing access or connection to or from a facility, system, or network not under that person's control, including transmission, downloading, intermediate storage, access software, or other related capabilities that are incidental to providing such access or connection that does not include the creation of the content of the communication." While this language is ambiguous, it does provide a way of thinking about institutional policies; they should clearly distinguish between those services that are provided by the institution—for which the institution will be held legally accountable—and those that are not.

Institutional services should be labeled as such, with institutionally controlled identification. If they include potentially offensive information, they should contain a clear warning of that fact at the beginning, and they should state that minors should not try to gain access to the information.

But what are we to do about those of our students who are minors? And what if we want elementary or secondary schools to have access to the information? Although we have no obvious answers to these questions, we should take one additional step: If the information we provide is potentially offensive, we should include a statement that clearly explains the educational reason for its presence.

Further, policies should make it clear that all Internet pages or services provided by students are the responsibility of the individual student. The policies should state that all other institutional policies —for instance, those concerning intellectual honesty, theft, and civility—are applicable to use of the Internet, and that individuals are subject to sanctions if they violate institutional policy, as well as to legal punishment if they violate the law. However, the policies regarding students should not be much more specific; greater detail may leave a college or university open to a charge that it has *de facto* accepted legal responsibility for the content of student pages.

Faculty members' use is more problematic. The C.D.A. states: "No employer shall be held liable under this section for the actions of an employee or agent unless the employee's or agent's conduct is within the scope of his or her employment or agency and the employer (A) having knowledge of such conduct, authorizes or ratifies such conduct, or (B) recklessly disregards such conduct." This language, too, is ambiguous, but it suggests that an institution may be liable for its employees' electronic pages, and that therefore these pages should be treated as institutional. This interpretation is consistent with the definition of institutional liability in lawsuits about copyright violation.

Such an approach may require greater administrative intervention into the electronic pages of faculty members than they will readily accept. However, it would be extremely difficult to create policies that distinguish an employee's personal use of the Internet from use that is "within the scope of his or her employment."

Cyberspace may seem like uncharted territory to many of us. But we must recognize that this brave new world is not unlike the rest of our environment. The laws that apply to individual behavior in other contexts also apply to behavior in the electronic world. And the opportunities for education are also similar. We must do everything we can to use the Internet responsibly, and to keep it open to all. ■

Richard A. Detweiler is president of Hartwick College. This article appeared originally in The Chronicle of Higher Education, and is reprinted with permission.

The Productivity Paradox, Revisited...

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A point to keep in mind: This means not only that we have to start managing our own time, it also means we have to be respectful of other people as they manage their time.

This concept is downright frightening to a lot of people I've worked with. Some people are afraid that if they draw appropriate boundaries around their time (and therefore restrict access by colleagues and/or students), they will be perceived as cold, unavailable, and unapproachable. Other people are afraid they will lose access to critical members of their unit.

Respect is a key issue in time management. It means having to put some effort into gently teaching colleagues and students how to respect the time you need to work as well as the time you have available to meet with them, and it also means respecting your colleagues' time to work uninterrupted and your students' time when they meet with you. It means forwarding your phone calls to voice messaging when you're working or meeting with people, but it also means returning the calls in a timely manner.

Computers can be marvelous tools to assist with time management. In addition to e-mail, there is software that allows a person to send and receive faxes (no more printing hard copies and then running down the hall to the fax machine in the office), and there is software that allows the computer to act as an answering machine.

Additionally, any computer capable of multi-tasking (most are today) can also run software that shows a calendar of events (and deadlines) while allowing the user to work in other programs (such as word processing).

Outlaw any sentence that begins with "We can't because ..." and replace it with an up-to-date inventory of all of your resources: time, people, skills, machines, responsibilities, and money. This information is vital to problem solving because it tells you what can be done now and what you need to do for the future.

Warning: DO NOT form a committee to accomplish this task (see next point). In most cases, one staff member going door-to-door can get this accomplished in a day.

> *We aren't going to solve productivity problems with five-year plans and time-management seminars. It's going to take some daredevil courage and radical changes in the way things are done.*

This, too, can be a frightening prospect for people because they are inherently afraid that they will not measure up (and therefore be cast aside), particularly when computer knowledge is involved. People need reassurance, both in word and in action, that they are being supported in their efforts to keep up with their numerous responsibilities. Piling on three classes in computer software without giving people time to learn is not only counterproductive, it is demoralizing. It is much better to create incentives (release time from certain responsibilities is a good start) and a positive atmosphere of mutual accountability.

Computers can be excellent tools for maintaining inventories as well as for teaching and learning. The instructor who learns to use a spreadsheet program can set up an "electronic grade book" to keep track of class members' progress. Simple formulas can calculate a student's current grade in a course. Also, instructors and students can use e-mail for effective communication.

Dispense with committees and meetings, and replace them with individual authority (Note: that's *authority*, not just *responsibility*) for renewable terms. This won't be possible in all circumstances. After all, it would be unfair to assign a major fund-raising project to one person, and it's not feasible to put one person in charge of such weighty issues as performance evaluations. But it will be possible in more cases than most people want to admit.

A cautionary note: While this will be met at first with much rejoicing, you can expect that most people will start feeling distrustful of the concept. In my experience, people are afraid that they haven't done enough to make themselves look good on paper at review time, and they are also afraid that if they are not invited to participate that they are being cast aside.

Computers are useful tools for storing and retrieving data as well as for communication with groups of people. With the right software and adequate training, it takes only one person to extract data on enrollment, budgets, and the like. With training and a little creativity, one person can take that information and turn it into useful tables and graphs that communicate histories and trends. Additionally, there are services available (presuming you don't want to purchase the equip-

ment outright) to turn your computer files into slides for presentations.

All of the above includes your secretary (or other support staff member) too! In most instances, secretaries and other support staff are the most knowledgeable people in the office about computer hardware and software. After all, they are usually the ones who have had the most practice with the equipment. Additionally, the support staff members are most often very knowledgeable and resourceful when it comes to actually getting things done.

It is foolish and wasteful to think that a secretary is only someone who answers the phone and runs the fax machine and the photocopier. Support staff members are valuable team members in any organization, public or private, including colleges and universities. As such, they should be able to, and be given the responsibility to, manage their time, and they should have authority over management of the office and its work flow.

However, it is entirely possible that this notion will send most people running and screaming from the building in terror. The historical model of a secretary—someone who smiles sweetly and pours the coffee, to put it succinctly—is, unfortunately, the image in the minds of many people in the 1990s, no matter how "liberal" and "forward-thinking" they think they are.

Attewell was right when he said in his article that in times of budget cuts, a company should avoid the "well-worn but often chosen path" of laying off the support staff, but his reasons were wrong. Secretaries should not function as "gatekeepers" on other peoples' time; that's the responsibility (and authority) of the individual. Secretaries and other support staff members are part of the whole team that makes the organization successful and productive.

If these steps to making your organization more productive look daunting, it's probably because you've been spending a lot of time on crisis management and entertaining far too many "We can't because ..." statements. Blame your problems on computers, a lack of time, poor management, or whatever else suits your fancy, but in the end you'll find that productivity comes down to effective and respectful management of time and people. ■

"The assumption of technology advocates is often that the use of technology is value free, meaning that if something can be done better with technology than without, technology will be used. Experience shows this is not true. Faculty do not perceive technology as neutral.... The use of technology in the curriculum is perceived as change. Organizations experience change as a disruption, particularly when the organization must change its habits to implement technology."

Diana G. Oblinger and Mark K. Maruyama
Distributed Learning
CAUSE Professional Paper Series, #14
1996

In Future Issues

- *Debunking the "special knowledge" myth for college presidents*
- *Putting up with IT prima donnas—are they worth the cost?*
- *How to make reengineering sound—or even be—non-threatening*

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EDUTECH RESPONDS

Q. The folks in our computer services department are very helpful and always respond to our calls for service and support promptly. I hope I'm not being too much of a nit-picker, but the one problem we do have with them is that when they come to our office to fix or change something, they do it in a way that is totally incomprehensible. Typically, they sit down at one of the keyboards and type away furiously for a time, and somehow, things are magically different. (Sometimes they have to do this a couple of times.) But it would be so much more helpful if they went through it in a way that taught us how to do it for ourselves the next time. Am I expecting too much?

A. *It depends on the nature of the task being done. The truth is that much of computing, despite its presence on your desktop, is still very arcane, especially the innards of it. When a techie comes to your office to do some work, it could be the kind of stuff that just needs to be done for technical reasons (repartitioning a hard disk, for instance) and that in the old days, would have been done behind the walls of the computer services department. You do have a point, however, if the service call has to do with anything that, if better understood by you, would empower you to be more independent in reasonable ways later on. Recovering lost files, for instance, would fall into this category. Meanwhile, be glad that they respond as quickly as they do; many computing departments are very overloaded these days.*

Q. We're going to be applying for an NSF grant for an Internet connection this fall. I'm told that one of the things the NSF needs to know is how we plan to distribute Internet access to the faculty. Is this true?

A. *Yes, it is. The idea here is that an Internet connection should be part of an overall campus networking strategy. If you don't have such a strategy, we suggest you develop one as soon as possible. A network is becoming a fundamental part of the campus infrastructure and will serve as the basis of all your computing before long. Chances are that there is a lot of "networking" happening already on your campus (LANs, individual accounts with Internet service providers, hardwired terminals to a mainframe, and so on) and it would certainly be in the institution's best interests to get this all under control.*

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EDUTECH REPORT

The Education Technology Newsletter for Faculty and Administrators

Reflections of an On-Line Graduate

by Emily Weiner

I saw my college for the first time on June 12, 1995, five hours before I graduated. My campus until that day had been my computer. I live in Bellingham, Wash., and for a year and a half I had been hooking up by modem to the State University of New York's Empire State College.

In 1993 I realized I needed a degree fast. I was teaching news graphics through the continuing education program at Western Washington University, but was told that, though I had two decades of professional experience, I couldn't be hired as an adjunct instructor of journalism without a bachelor's degree. At that time, I had about two years of college credits, accumulated from three different schools from 1968 to 1971.

I was an on-line pioneer. By the end of this decade, cyberspace diplomas may be common. Innovative electronic teaching materials that will prepare students for work revolving around computers will free educational institutions from the limits of geography. Courses that teach students to work on-line won't be bound by classroom walls. Journalism students are already editing electronic newspapers. In my on-line experience, I merely talked via e-mail with the mentor assigned to me by Empire State, used the Internet for research, and participated in a computer conference course that was like a private chat room with a goal, a time frame, and a leader.

How well will students be served by these new forms of teaching? In June the governors of 10 Western states announced the establishment of a virtual university. One of its key goals is to lower the cost of education. I worry about this because their plan

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"If learning requires genuine participation, distance learning often provides its illusion only, while actually keeping students at a disempowering distance. This is a particular risk with use of the Net. As anyone who has sent e-mail to the White House, Congress, or even a newspaper knows, the Net can provide a powerful impression of interactivity and exchange while in practice denying both. Similar problems are likely to arise for on-line students. A distal learner, for example, may achieve access to public forums used by a campus class, but the campus community's private, off-line interactions will remain both inaccessible and invisible."

John Seely Brown, Paul Duguid
"Universities in the Digital Age"
Change
July/August 1996

NEWSBRIEFS

DISTRIBUTED LEARNING

CAUSE, the association for managing and using information resources in higher education, has published its fourteenth Professional Paper, *Distributed Learning*, by Diana G. Oblinger and Mark K. Maruyama. The paper explores the potential for technology to not only enhance, but actually transform, the delivery of higher education in the information age. The impetus for change to a learner-centered model is discussed, and real-world examples are offered from fifteen institutions who are using technology to accommodate such change.

Funding from IBM enabled publication and distribution of complimentary copies of the paper to more than 3,500 CAUSE member representatives. Copies are available to anyone on a CAUSE member campus at $16 per copy, or to non-members at $32. For more information, contact CAUSE, 4840 Pearl East Circle, Suite 302E, Boulder, Colorado 80301; (303) 939-0310; orders@cause.colorado.edu.

INSTRUCTIONAL TECHNOLOGY, PEDAGOGY, AND THE CURRICULUM

"Instructional Technology, Pedagogy, and the Curriculum: Rethinking the Teaching and Learning Process" is the theme of the Sixth Annual Institute for the Study of Postsecondary Pedagogy, School of Education, State University of New York at New Paltz, to be held November 20–22, 1996. The keynote speaker at the conference will be Steve Gilbert, Director of Technology Projects at the American Association for Higher Education. Topics include technology and global education; designing courses in distance education; changes in research paradigms and pedagogies; applying and evaluating multimedia/hypermedia systems; applying technology to interdisciplinary curricula; and many others.

For more information, contact the Program Committee, Postsecondary Conference, Humanities 110, SUNY at New Paltz, New Paltz, New York 12561; (914) 257-3590; kelderr@npvm.newpaltz.edu.

CALL FOR PAPERS FOR AUSTRALASIAN CONFERENCE

The organizing committee of the CAUSE in Australasia 97 Conference, to be held April 13–16, 1997 in Melbourne, Australia, invites everyone involved in the higher education industry to attend and to submit papers. The conference is supported by CAUSE, as well as the Committee of Australian University Directors of Information Technology (CAUDIT) and the Council of Australian University Librarians (CAUL). The theme is "Information Technology: The Enabler" and will include topics on electronic publishing, the remote delivery of educational programs, supporting technologies, and management issues.

Abstracts for papers are due August 30 and should be no more than 200 words. For more information on the conference, contact Graeme Knox, Director, Strategic Information Technology, Royal Melbourne Institute of Technology, 124 LaTrobe Street, Melbourne, Victoria 3000, Australia; Telephone: 61-3-9660-1790; knox@rmit.edu.au.

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So, What Have You Done For Me Lately?

Ever notice that the airlines make a big deal about publishing their on-time statistics? Especially those airlines that manage to keep relatively well to their schedules and rack up good on-time performance are enthusiastic about sharing that information with the public. The problem is that this kind of performance data is relevant to the potential flyer only in the negative. That is, if a flyer knows that Airline X achieved an 82% on-time rate for the month of June, that really means that *18 flights out of every 100 were late arriving at their destinations that month*. Depending on how often you fly, that can range from mildly annoying to horrifying. And yet, airlines are proud to display these numbers.

Why? Because the airlines haven't caught on yet to the fact that flyers *assume* the flight is going to be on time, and when it is they take it for granted. The only time flight statistics are relevant to a flyer is when he or she is sitting out on the runway two hours past take-off time on a one-hour flight, listening to the pilot say over the intercom that they are fourteenth in line for departure; sorry, folks, it's going to be yet another half-hour before we even get off the ground. That flyer doesn't give a hoot *if every other flight that month was on time*. The airline could have a 99 and 44/100 percent on-time record and it wouldn't matter a fig to this flyer. The airline is not judged in the flyer's mind by its on-time statistics, because the flyer takes on-time performance for granted. Instead, what the airline is really judged by is how it deals with less-than-perfect performance.

We have come to take certain things for granted and to assume certain performance levels from the goods and services that make up our everyday lives. We assume that when we flip the wall switch, the ceiling lights will turn on. We assume that when we pick up the telephone receiver, we will hear a dial tone. We assume that when we arrive at work in the morning, our computers will be working and the network will be available. And when all these things happen, we take it for granted. We are not grateful; we are not particularly proud of the supplier of those services; we just simply assume that this is the way it's supposed to be.

The flip side, however, is where judgements do come into play.

> *A computer center does not get high marks for 99.99% uptime of the network, regardless of how much effort it takes to achieve that high level of availability.*

When the lights don't turn on, we're (at best) annoyed. When the dial tone isn't there, we're (at best) worried and concerned. And when our computer isn't working or the network isn't available, we're—increasingly—hopping mad. As our dependence grows, and as we come to take these things for granted, outages become increasingly unacceptable.

The only thing that can help in the unwanted circumstance of an outage is the right kind of treatment of the problem. And this treatment has to include both the swiftest possible resolution of the problem and, equally important, a communication to the user/customer that the supplier cares deeply about this extremely unfortunate circumstance and is doing everything possible to rectify it.

In other words, judgements about the quality of certain services are made by the users of those services not by how much the services are available, but by how the supplier deals with the situation when they are not available.

An airline does not get high marks when it posts that it was on-time 95% of the time last month. However, an airline *might* avoid getting a reputational black eye during a delayed flight if it does the right things: informs passengers as to exactly what's happening, tells the truth about when it expects to really get going, serves the meal early (even while the plane is still on the ground), has the pilot come out and chat with the passengers, and most important, apologizes deeply for the inconvenience and promises to never, ever have this happen again.

A computer center does not get high marks for 99.99% uptime of the network (regardless of how much effort it takes to achieve that high level of availability). However, a computer center *may* avoid getting a low mark during that .01% downtime if it can demonstrate—in both words and deeds—that everything possible is being done to restore service, that the computer center cares deeply about the inconvenience it is causing, and that definite steps are being taken to make sure this never, ever happens again. And at the end of the month, when the computer center publishes its 99.99% statistic, the people on campus who even bother to read it will be unimpressed. They will remember only what the computer center did during the .01% downtime. ■

Student Dial-Up for Internet and Campus Access:
The Technology Was Easy; The Process Was Not

by Christine Hurst, Boise State University

As all of us involved with higher education information technology know, the growth and expansion of IT in the education arena have increased substantially over the last ten years. My institution, Boise State University, was a leader in providing, at no cost to the student, e-mail and Internet access before these became household words. There were no local Internet Service Providers (ISP) ten years ago to provide access we needed to the Internet forerunner, BITNET.("Because It's There Net" —a network among educational institutions used mainly for research and communication). However, because of changing technology and the emergence of the Internet, Boise State University decided that from a support and financial position, the institution could no longer provide no-cost student access to the Internet. The challenge then became how best to do make the transition.

When BSU originally decided to provide access to students, much time was spent determining what the student identification or e-mail ID for the students should be. Scenarios were run through on a computer to determine what the least number of duplications would be out of the student population, leading ultimately to a decision to use a combination of characters from student last name and student ID. To reduce the number of problems we would have to deal with, the service for access to the Internet was not advertised as being available during the first semester. When the service was initially offered, the speed of the modems used for access was 2400-9600 baud. But with changes in technology, the standard quickly became 14.4 (or higher). The campus had a site license for software which was distributed for dial-in access.

Then came pictures, sound, and games. These services needed different equipment, software, and security. The number of student accounts doubled the beginning of the following school year.

> *In true "shared-governance" form, the computing committee spent several meeting sessions discussing possible options. Everyone was sensitive to the students and the fact that the price for access must be reasonable.*

To accommodate the increase in students and the demand for access to graphics and other services on the Internet, equipment was updated. An authentication process to make sure an individual was eligible for the service was also put in place. This meant the people dialing in to gain access to the Internet through BSU had to be a valid student, faculty, or staff member. The authentication process cut down on the amount of traffic into BSU and made the telephone lines available for the BSU community. While helping initially, the number of students with computers increased and the demand to be able to dial-in from home to gain access to e-mail, assignments, and other items on the Internet also increased. Telephone lines were constantly busy from 5pm to 4am and often most of the day. Students were unhappy, but professors still continued to make assignments requiring Internet access. Many students went out on their own and acquired personal Internet and e-mail accounts in order to be able to fulfill their course and personal requirements.

Assistance for students with problems dialing in was provided through a two-pronged approach. The reception desk for the center answered questions regarding IDs and passwords. More sophisticated assistance was provided by the help desk. Depending on the time of year, as many as 10 percent of the center staff was assisting students with questions relating to dial-in and Internet access.

Because of the increased demand for access and the fact that the university would not be able to keep up with the number of modems and changing technology needed to provide access, the decision was made to go out for bid for dial-up access. While it would appear the decision to do this was made quickly, this was not the case. In true "shared-governance" form, the computing committee spent several meeting sessions discussing possible options. Everyone was sensitive to the students and the fact that the price for access must be reasonable. The students who did not require dial-in access would still be given an e-mail account which could be accessed from any lab on campus. The campus access also provided Internet access for the students.

The cost of access for a semester was looked at as not being much different than a book that is required for a course. In the case of the Internet, it could be used for more than one course. Some students argued that the cost of access should be paid for by the institution. But because the access would be more reliable by an Internet Service Provider, students realized something needed to be done. They went so far as to propose an increase in fees with the increase to go toward more modems, but did not understand the need for investment in support staff as well.

A Request for Proposal (RFP) was put together to go out to bid for student e-mail and Internet access. The bid was put out for a two-week period. At the end of the time period the bids were evaluated by three BSU staff members and two students. The students contributed to the discussion regarding the RFP by, among other things, seeing that either local access numbers or free 800-number service was included in the responses.

The RFP was rated on four categories: cost, service, technical specifications, and financial stability. These categories were chosen because of the interest in providing the most cost-effective solution to the students, making sure that what was proposed was technically feasible to provide the most effective access possible. This included whether the equipment was located at the university site or at the ISP site. Service was important to provide help desk service and answer student questions when needed. This included being able to transfer calls to the ISP when they were received at the local help desk. For financial stability, the evaluation committee wanted to make sure the company had been in business for a period of time and was not just being operated out of someone's garage.

After the RFP was awarded the contract negotiations were under-

> *The RFP was rated on four categories: cost, service, technical specifications, and financial stability. These categories were chosen because of the interest in providing the most cost-effective solution to the students.*

taken and completed. Of concern to the central information technology group was how the roll-out to the students was to be accomplished. Students who currently had accounts needed to be notified and students who had previously purchased accounts from the ISP needed to be rolled over under the new contract terms.

Advertisements were placed with the student newspaper as well as posting notices around campus. Electronic notes were also sent to the current students with accounts. Students who did not require dial-in access were still provided with an e-mail account with Internet access that could be accessed from any of the computer labs on campus. This addressed the concern of some professors that their classes required students to send homework electronically. Professors felt students should not be required to pay for this; access from campus to their accounts either on campus or through the ISP fulfilled this requirement.

Lessons learned

Other institutions who have gone out to bid for Internet and dial-in service include the University of Montana and Montana State University. While others indicate at some point they will need to pursue this course of action, it is but a matter of time before they actually do. Shrinking budgets prevent us all from keeping up with the increased demand for services and the changing technology.

The lessons we learned from this process include that while it is good to be able to provide a service in-house, at some point the decision to outsource the service may need to be made. Second, especially with a service that is so student-centered, students need to be involved in the decision to outsource and also in the evaluation of the RFP responses. Involvement of the students in a process that both benefited and affected them at the same time was critical to our success. The students involved in the process took it very seriously in that they wanted to get the best possible arrangement for the students. As on our campus, the students that are involved in the process can then assist in the promotion and inquiry from other students, thus dramatically increasing the chances for success. ■

Christine Hurst is the Director of Computer Services at Boise State University.

Reflections of an On-Line Graduate...

continued from page 1

so far is silent on the value of personal contact between students and teachers.

My experience was terrific because my relationship with my mentor thrived over the computer network. The guided independent study model that Empire State College developed 25 years ago provided an effective alternative to conventional college for adults who wanted to pursue individually structured programs. This is why it survives so well even in the isolation of cyberspace, where you are connected to the school only by a telephone line.

I was a perfect fit with Empire State's teaching design. I wanted a program that would grant enough credits for prior learning so I would have to register for the full-time equivalent of only one academic year. I didn't want to lose momentum in my teaching and freelance writing; I needed a school that would let me incorporate work projects into my study program. I also needed to fit my schoolwork into the time constraints of caring for my two sons, 10 and 3.

When I enrolled, Prof. Diana Worby was assigned as my mentor. Instead of meeting every week or so in her office in Nyack, N.Y., we sent e-mail messages every few days. We used ordinary mail for packages of manuscripts and other material. Diana guided me through the process of developing a personal degree program, organizing my prior knowledge into academic equivalents that could be granted college credits, setting up and completing learning contracts for independent study, registering for one college class locally and one computer conference course, and arranging an internship at a public radio station. And she was with me while I did the work.

It can be lonely going to school sitting at your own desk. We exchanged photographs so Diana could picture me with my husband and kids and I could see her broad supportive smile as I wrote. As we got to know each other, Diana's commitment to my successful completion of my degree was as palpable as if I had been in Nyack with her. In fact, our meeting the afternoon of my graduation was in some ways a letdown. I had expected fireworks. Our e-mail conversations had felt so intimate, that, after a long-awaited hug, there wasn't a new closeness to experience.

> *Despite my excitement about new electronic educational opportunities, I'm concerned that others seeking convenient on-line degrees won't have the opportunities to find programs that nurture them intellectually and emotionally.*

Looking back into the file folders stuffed with printouts of our e-mail correspondence, I find lots of necessary details like, "I wrote up the evaluation of your first contract." But these were usually sandwiched inside descriptions of what we were doing or thinking about on particular days: my son bicycling off to his first day of fifth grade; Diana's grown daughter's search for record albums they'd listened to together many years before; leads I was pursuing for part-time work, and articles and books we recommended to each other.

While some students might find it a burden to have to accomplish almost everything with the written word, for me it was an extra opportunity to improve my writing. What appears on the surface to be primarily old-fashioned (although high-tech) correspondence between two thoughtful friends was also the vehicle for an experienced critic of literature to let me know when she was particularly informed, moved, or challenged by my writing.

My computer conference with a tutor used an independent study structure that had been developed for correspondence courses. We still read assignments and mailed in papers, but instead of scheduling individual phone conferences, the teacher of our section met on-line with me and the other student in the class.

The biggest difference I noticed from typical classroom discussions was that, with time to edit our contributions and without other people waiting their turn to speak, we developed our thoughts more fully and addressed the complexity of topics instead of making a single point at a time. Every so often, the teacher suggested a different way to think about something or added relevant assignments to those in the printed course guide.

I enjoyed finally meeting another Empire State College student. We chatted about his Greenwich Village neighborhood where I had once lived, and joked about his e-

This article appeared originally in the "Education Life" section of the Sunday edition of The New York Times, and is reprinted with permission.

mailing me a loaf of Zito's whole wheat bread. (My mouth watered.)

The on-line world is changing so fast that, if I were enrolled today, I would use Writer's Complex, Empire State's new interactive tutorial on writing and researching. I could follow links to screens about punctuation, style, and how to write a research paper, read sample student papers in different disciplines, practice writing exercises, hang out with other writers in the virtual student lounge, and contact tutors for help.

Despite my excitement about new electronic educational opportunities, I'm concerned that others seeking convenient on-line degrees won't have the opportunities to find programs that nurture them intellectually and emotionally. Individual course requirements can certainly be completed by exhibiting competence on tests or by sending in papers or by using new interactive computer programs. But will there be a person on the other end of the line who is watching to see that students are stretching themselves, choosing appropriate courses, struggling with new ideas, overcoming personal obstacles, getting smarter?

I'm concerned that feedback will be limited to course work itself, and that the fuller relationships that develop between students and teachers on a college campus will be missing. I'm concerned that part-time instructors will be hired course-by-course but won't be paid enough or be on staff long enough to be available to guide students through the full process. Every student needs someone to say, "You're doing fine, just keep at it," or "Whoops, you're not going to make it unless you try another approach." Whether it's a mentor or faculty adviser, it has to be someone who knows what's ahead in a field of concentration better than the student.

There are probably other models that will work as well for on-line students as Empire State's, but only if the virtual university aims to be more than a collection of courses. Teachers need structures that give them a stake in their students' success. I hope that the shift of education into cyberspace represents a continuation of the drive for excellence and not a retreat. ■

"The focus on distance and delivery (of education) overlooks not only the needs of students, but all too often the strengths of new technologies, which are distinctive because they are interactive. Previous communications technologies—books, film, radio, television, telephones, video—have all supported distance and delivery, but they have primarily permitted only one-to-many or one-to-one communications. Knowledge communities, however, are built on more complex interactions, such as continuous conversation.... The explosion of interactive technologies for the Internet argues that in the 21st century mediated communications will expand the possibility for rich, distal interactions —urging consideration of more than distance in distal learning."

John Seely Brown and Paul Duguid
"Universities in the Digital Age"
Change
July/August 1996

In Future Issues

- *Hot Issues 1996-97: our annual reader survey*
- *Another look at the issue of outsourcing*
- *Web access to administrative information: are you on this band wagon yet?*

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EDUTECH RESPONDS

Q. I am chairing an administrative system selection committee, and we have been asked to submit our recommendation of the most appropriate system and vendor to the President's Council. We are just about to make our decision, and believe it's a good one. However, many of us are concerned that in submitting the pricing information associated with the choice, the decision makers will see that number and think it's the budget for the whole project. We know that isn't so. How do we avoid giving them this idea?

A. *We would urge you to create a realistic and specific project budget before you make your decision. Don't fall into the trap of making the suggestion to the top administration (even implicitly) that the implementation budget equates with the software license fee. As you know, there is so much more involved in having a successful implementation, not the least of which is a plan to address the areas that the new system will not cover or that will cover inadequately. There are almost always areas in the current software that users have come to treasure, in a sense, and whose functionality must be duplicated in the new system; if they aren't there, they need to be accommodated somehow. In addition, there is often a need for additional training beyond what is offered in the baseline package, interim staff (at least for data entry), desktop hardware upgrades, and so on. The decision makers at your institution need to be made aware of this from the moment they see your recommendation (if they aren't already!).*

Q. We are about to undertake a reorganization of our entire IT services department (125 people). Is there a right way to go about this?

A. *In general, we suggest the following: determine what set of IT services and products the institution needs right now and assign relative priorities to each item; create the best on-paper organization to deliver those products and services, addressing the highest-priority items first; do an interest-and-skills inventory on all staff members; slot each staff member into the best-fitting position; and finally, provide whatever training and reorientation is necessary to fill the gaps between what's needed by the community today and what is available from the current staff. And keep in mind that change is hard.*

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THE EDUTECH REPORT

September 1996

Volume 12
Number 6

The Education Technology Newsletter for Faculty and Administrators

Hot Issues 1996-97

As most of our readers know, each year at this time, we conduct a telephone survey among higher education information technology professionals and their institutional colleagues to find out what this academic year's hottest technology issues are. We usually talk with a hundred or so folks, most often those who are dealing with the day-to-day issues of providing IT products and services to a diverse community of users, but also those who are concerned with the longer-range, strategic issues of managing, planning, and budgeting for IT as an institutional resource.

One of the wonderful things for us in doing this article after so many years is gaining the sense of how much things have changed in such a short period of time—and how much they have remained the same. Some quotes from our "Hot Issues" article in September of 1986: "A new way of easily producing close to typeset-quality material directly from hardware and software close at hand, desk-top publishing may be the issue of the year." "Now that micros are everywhere, a major problem that has arisen is the ongoing support required to help people use them effectively." "The item many institutions will be struggling with this year is the place of the library in the overall technological picture." "Increasing numbers of schools, it seems, are beginning to wonder when all of the long-promised productivity gains [from their administrative software systems] will finally appear." "There is going to be much activity and interest in academic software this year, and it just may be that this will be the year that quality takes a great leap forward." And, of course: "Finding the resources for computing activities is still a major problem for many institutions."

continued on page 4

"...Support services for technology-based information resources are facing a crisis of demands. [There is] a growing consensus among our profession that the traditional operational model is broken, that few people understand the complexity of the new environment, and that pressures on information resources staffs are enormous.... Under these circumstances, institutional leadership seems to be panicking. Among the tempting solutions: fire the technology director, hire a CIO, allocate large amounts of money, reorganize the information resource function, ... bring in a consultant."

Polley Ann McClure
"Challenge for IT Support Services"
CAUSE Information
May/June 1996

NEWSBRIEFS

CALL FOR PAPERS ON MULTIMEDIA IN EDUCATION

A number of changing trends in multimedia technologies have produced a variety of new tools and new media, such as CD-ROM and Web technology, which are beginning to play an ever increasing role in the development of learning and teaching in primary, secondary, and tertiary education. As the field expands, it is possible to identify commonalities in problem-solving techniques used to develop materials.

Authors are invited to submit papers for inclusion in a special edition of the *Computers and Education Journal*. The principal objective of the special issue is to focus on the application of multimedia to current research topics and address advanced educational issues, thus driving future developments in multimedia-based learning. Papers should focus on the application of multimedia and advanced educational issues, particularly in the areas of computer modeling of student and complex domains; support for student problem solving, co-operative learning, collaborative work, situated work, and self reflection; intelligent tutoring; cognitive task analysis; interactive multimedia; evaluation; and tools for developing images.

To facilitate the review process, authors are asked to submit a brief notice of intention to submit by e-mail to both guest editors: Beverly Woolf, bev@cs.umass.edu and David Bird d.r.bird@iti.salford.ac.uk. Notices should include a draft abstract describing the subject and scope of the paper in sufficient detail to indicate that the proposed paper is in an advanced state of preparation, including the name, affiliation, address, telephone, and e-mail address of the author who will serve as the primary contact. Papers should be about 4000 words and present clear research methodology and findings where appropriate. Full instructions to authors can be located on the Web at http://www.elsevier.nl/locate/compedu.

SEMINAR ON TRANSFORMING HIGHER EDUCATION

"Transforming Higher Education" helps leaders in higher education understand the process of transformation in their own organization, beginning with their own staff and needs. Topics include realigning your organization with the environment; redesigning your organization to achieve the new intent; redefining roles and responsibilities within your newly realigned, redesigned organization; and reengineering organizational processes to achieve higher productivity and quality. Participants also will explore emerging, transformed learning environments—including virtual universities, virtual classes, and virtual academic departments.

The seminar leader is Michael Dolence, president of Michael G. Dolence and Associates and co-author of *Transforming Higher Education: A Vision for Learning in the 21st Century*. Seminar fee is $495. For more information, contact William S. (Chip) Pate, Jr., Ph.D., Program Director, Institute for Academic and Professional Leadership, The Friday Center, CB #1020, UNC-Chapel Hill, Chapel Hill, North Carolina 27599; (919) 962-3276; iapl@unc.edu.

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Technology Purchasing Cycles

by Raymond Phillips, Colby College

Colby College is a Macintosh-standard institution (1,700 students, 160 faculty, around 500 total employees) with 900 college-owned Macs, about 40 PCs and 25 high-performance UNIX workstations, plus a farm of central HP systems. Our network reaches to every office, classroom, and dorm room (at last), as of this summer. About 75% of our students own a computer; 73% own a Mac. We centrally budget for and distribute computers, software, and networks.

Three years ago we put in place a replacement strategy and the budget to enable us to get rid of old computers and provide appropriate hardware and software for faculty, staff, and student clusters. It enables us to have an expectation that a computer will be used on campus for an average of 4.5 years. We added 200 Macs to the campus this summer and will get rid of nearly that many.

We looked at a variety of models for replacing computers. The possibility of a two-year cycle was very attractive, for one because the computer has some significant residual value on the used equipment market, making it possible to cover some new equipment purchase costs. That strategy can work very well for an organization of people at some relatively uniform (especially high) level of need. It allows you to keep them all at a relatively advanced state of technology. However, college and university campuses are very diverse and will always be so. There are those who need the newer technology but there are those who can do their work very effectively with three- or four-year-old technology.

A new computer used by a more advanced member of the community for two years or so can be passed along to another who can make very effective use for another two years or so. If I were to try to buy a computer for a person in that second group every two years, it would probably be something like a two-year old machine (or two-year old technology). But guess what? I already have that computer for them to use!!

Technology change is hard for everyone to cope with and faculty and staff members want reliable computer systems that will help them do their work. The majority of people don't want to upgrade every year, but every other year is just about right. They grow in their use of the technology and their desktop or portable system becomes limiting. If their next upgrade is sufficient to keep them expanding comfortably for two years, that is optimal.

The biggest problem we have had implementing the replacement cycle is simply logistics. Every summer we have a mountain of new systems needing inventorying and a complete set of installation services. Then we need to deal with the older computers: backups, transferring the appropriate items onto the new machines, reformatting the drive to preserve confidentiality, taking it to its next two-year assignment, going through a similar process there, and finally, preparing the four-year-old computer for sale.

We make these machines available to faculty and staff at below-market value for use off-campus. What we don't sell we donate to local schools. We could get something for them from used equipment remarketers but the amount is so low that we would prefer that local schools have them instead.

It is actually about a third less labor intensive to have a four-year replacement cycle than a two-year cycle. In a two-year cycle (assuming you aren't trying to upgrade everyone every year with either a new or a one-year-old computer—yikes!) we would have to handle 450 new computers and 450 outgoing computers, a total of 900. As it is, we handle roughly 200 new, 200 hand-me-downs, and 200 outgoing, for a total of 600. This is done by one staff member and three student assistants (who all have other support tasks going on as well), although at times other assistance is needed.

The most tempting pitfall in any plan like this is to avoid finding new places to put those old computers. We get the familiar request—"Anything will be fine and we will never ask for an upgrade." Of course, if it is important enough to put a computer there, it should be assumed that it is going to be important to keep it functioning at a level that the inevitably expanding uses will demand. There has to be a limit placed on the growth in the number of new stations (a place where a computer sits). We could find 200 new places to put the oldest computers every year, but that would completely dismantle the replacement strategy. Defining appropriate expansion in the total number of computers and having the mechanism to say "no" beyond that number requires effective institutional processes. Our process uses an allocation committee with senior staff participation making those decisions. ■

Raymond Phillips is the Director of Information Technology Services at Colby College. This article is based on his recent posting to the AAHESGIT listserv.

Hot Issues 1996-97...

continued from page 1

And for this year, the winners are:

The World-Wide Web. It seems as if no aspect of campus life remains untouched by the Web; from classrooms to administrative offices and from libraries to dorm rooms, students, faculty, and administrators are using (or at least have plans to use) the Web for just about everything. It's hard to imagine that the Web has penetrated any other environment to the extent that it has higher education.

And most of the folks with whom we talked for this survey think we have only just scratched the surface so far. In fact, the Web, and even the Internet itself, has come upon us very quickly, and there are lots of both opportunities and challenges surrounding them that have yet to be settled, or even fully explored.

For example, the Web has forced the issue of extending the campus network to dorm rooms at many institutions, representing a huge expense that has taken some schools by surprise. It's not that the network wasn't needed in the dorm rooms anyway, but access to the Web has turned out to be an even more compelling factor for the purse-string holders than extending library facilities to the dorms. And what is the best way of providing off-campus access? Both for commuter students and for faculty (and some administrators) who wish to work from home offices, slow dial-up lines connected to the campus through modem pools are really not acceptable in the graphical world of the Web.

Then there are usage policies to consider—and not just for access privacy and security. It's very easy to create pages for the Web, raising the question of whether everything that's created by anyone at the institution actually "belongs" to the institution, including educationally questionable material (that's the latest euphemism for dirty pictures). The Communications Decency Act versus academic freedom is an issue that has only just begun to rear its fascinating head, and could become one of this year's most explosive ones.

There are related issues having to do with overload (how is the infrastructure going to handle the traffic when people *really* begin to use the Web?), data quality (what is the point of having a pretty, user-friendly Web-browser interface to unreliable and untimely data?), and the too-rapid obsolescence of desktop hardware (how can I be expected to teach my class using Web resources if I have only a 386 clone on my desk?)

It's very easy to create pages for the Web, raising the question of whether everything that's created by anyone at the institution actually "belongs" to the institution, including educationally questionable material (that's the latest euphemism for dirty pictures).

Mediated classrooms. This has, very suddenly, become a very hot topic on many campuses. Even for those institutions that have constructed dedicated technology facilities in the last few years, and where one might assume that the issue of mediated classrooms has been settled for the time being, just the opposite has happened. The faculty who have to teach in classrooms on other parts of the campus now know what they're missing, and the issue is quickly becoming, How do we make *all* of our classrooms technologically sophisticated? The days of rolling an overhead projector around campus are definitely over.

Creating mediated classrooms has begun to take on the proportions of the campus network in terms of the global questions to be answered: where, how many, what are the major design issues, and how are we going to pay for all this? At the very same time, while networking has clearly entered the realm of necessity-not-frill, mediated classrooms are still seen by some administrators (and yes, even some faculty) as educationally questionable. Looking for and demonstrating the specific educational benefits of multimedia has started to be the favorite topic choice at many conferences.

The IT organization itself. Always the subject of more-or-less intense scrutiny, the IT organization now appears to be under the institutional microscope for real. Do we have the right people? Do we have enough people? Do we have the right support and training programs for them? Have some of our folks been with us too long? Are our salaries high enough? Are we organized in the most effective way? Does the IT area report to the right position at the institution? And that old favorite: Should we combine our administrative and academic computing departments? (variation: should we stick the library in there too?). The fact that these are still serious, consternating questions on many campuses is

the strongest indication of all that, despite our fondest wishes otherwise, there is no One Right Way to do this.

The crisis in support services. This is an issue we have been hearing consistently for years, and appears to be getting worse and worse. Regardless of the size of the institution, the size of the IT department, the resources available, or the state of the technology, one clear fact remains: the demands for IT services continue to overwhelm the supply.

Interestingly, while limited resources often play a part in the crisis, that factor is rarely, and sometimes not at all, the whole answer to this issue. In fact, resources seem to be easing a bit. With record enrollments at many tuition-dependent institutions this fall, the pressure on institutional budgets is not quite as severe as it has been in recent years, and the corresponding demand to cut IT budgets has lessened in many places.

The nature of the crisis seems to have much more to do with unlimited demand than with limited supply. As one respondent put it, "It wouldn't matter if the pot of gold at the end of the rainbow were bottomless—our users would want more." Apparently, also, no one on campus wants to deal with setting priorities, usually leaving this, by default, in the hands of the IT department to sort out however it can.

And it's the diversity of demands that makes providing IT services so difficult, not just the volume. No other setting has the range of experience, technological proficiency, and applications mix that are typically found on a college campus. From first-time users to highly skilled computer scientists, from doing a spell-check to analyzing weather data, the diversity alone makes even a relatively straightforward task like setting up an effective Help Desk enormously difficult.

The mood of the CIO. Is this an impossible job? Are institutions so IT-challenged that no one person can succeed for very long as a CIO in any one place? Are CIOs used as scapegoats for the institution's inability to be able to make difficult priority and resource decisions? Are CIOs unfairly blamed when the technology does not live up to the institution's completely unrealistic expectations?

From first-time users to highly skilled computer scientists, from doing a spell-check to analyzing weather data, the diversity alone makes even a relatively straightforward task like setting up an effective Help Desk enormously difficult.

The CIOs with whom we talked are generally very depressed. Not all of them, to be sure, but enough so that it is clear that the general anxiety level is much higher than it should be. Even though we had reason to expect just the opposite by now, the gap between the CIO and the rest of the administration seems to be widening. And this is regardless of what level the CIO is at in the institution. As we heard from one CIO respondent, "This institution created the CIO position so that no one else at the top level had to ever think about IT again. That has turned out to be a disaster—for all of us."

Distance education. This is most definitely a Hot Topic, if one goes by the amount of time people are spending just talking about it. On the other hand, there are not many institutions actually doing it yet. There are lots of issues to sort out here, including academic quality, the value of face-to-face contact, the relative effectiveness of a wide variety of distance-learning approaches, the actual logistics and support issues, and so on, so we suspect this will be on the Hot Topics list for a while.

Reengineering. Another area that is receiving more talk and thought than action at the moment, reengineering still holds the attractive promise of helping our institutions be both more efficient and more effective at the same time. That alone should keep it on this list for several years.

Reengineering is also linked in interesting ways with modern administrative information systems, which many institutions are in the midst of either choosing or installing. Most of these projects seem to be going relatively well, although there certainly is no such thing yet as a problem-free, completely uneventful and smooth implementation. Many IT folks, and even more users, wonder why the software vendors haven't solved this yet. ■

Editor's note: As always, we want to thank all those who took the time to talk with us and we wish everyone a fruitful, productive, and satisfying year.

Quality-of-Service Problems on the Internet

by E. Michael Staman

It turns out that a great many of the quality-of-service problems that Internet Services Providers (ISPs) have been carefully managing since the beginning days of the NSFnet privatization have begun to surface, and most recently in ways visible to the user community. Most discussions about the why and what to do range from "higher education needs infrastructure devoted solely to its needs" to "the commercial marketplace is the only solution, and once the money formula is right all will be solved." Discussions about the former are currently tending to focus on the needs of the large research universities, while discussions about the latter (within the higher education community) tend to reject the thesis of a fully privatized solution but increasingly understand that money is part of the problem. One key conclusion is that for the majority of higher education, there is real risk of continued problems, but that should not be translated into "... it will come crashing down around our ears ...." Several observations:

First, recognize the nature and maturity of the technology. In a limited defense of the ISPs, the fact that the Internet works at all is somewhat amazing. I know of no other technological evolution which has grown at the rate of the Internet, and neither can I think of any other infrastructure, of any kind, that could withstand the pressures inherent in that growth and still be functioning. Remember that the "privatized" net is less than two years old, that we are in the midst of a very difficult transition, and that we can therefore expect turmoil for some period to come, even though we would all prefer otherwise. My engineers tell me that this may be a beginning, not an end, and that while the current problems are solvable we can expect things to get a tad worse before they get better. I note for example that no one—repeat, no one—predicted things such as real-time applications on the Internet becoming popular and commercial so quickly. Examples of these include packetized audio, video, electronic commerce, computer telephony, Web-searching, and other Web-based applications. These are also only beginnings as the entrepreneurial capabilities within the nation become unleashed.

The fact that the Internet works at all is somewhat amazing. I know of no other technological evolution which has grown at the rate of the Internet, and neither can I think of any other infrastructure, of any kind, that could withstand the pressures inherent in that growth and still be functioning.

So, as some have observed, the explosive growth of the commercial marketplace is a real part of the problem. CICNet, my organization, has felt such pressures. And while we have had fewer problems than many, we have not been immune from either internally generated problems or failures within the larger Internet. We remain as the last large, not-for-profit, multi-state networking organization owned by a higher education consortium, something likely *not* to change. We are increasingly finding that our commercial traffic is becoming such a significant part of the total that we will soon need to find a way to solve infrastructure problems (and related organizational structure issues, no doubt) to protect both our commercial customers and our owners. (We are owned by the CIC universities, a.k.a. the "Big-10 plus Chicago." And while our not-for-profit and research-and-education focus will likely not change, what might change is that our networking solutions might not include actually operating a physical network, especially with respect to the needs of our large, research-focused universities.)

Second, I should note that we, as a second-tier provider, have been hit by many of the same problems that others have had. Our backbone provider's network (and we think our provider is the best in the business) continues to show congestion at the edges, even though they have made remarkable progress in the interior of their network.

Third, recent weeks have had a number of national-level failures within the Internet, which we believe have been caused by "hackers" (we'd prefer a different term) who are exploiting holes in router configurations to overload the routers.

And fourth, many of the low(er)-end providers oversell their trunk lines by ridiculous amounts so it is hard to feel sorry for them when these trunks fill up.

Mike Staman is the President of CICNet, Inc. in Ann Arbor, Michigan. This article is based on his recent posting to the CIO listserv run by CAUSE.

It is important to understand that the solutions of the past are generally not available. For example, the research-and-education mission of many of the old NSF-sponsored regional networks is no longer relevant, either because the network is gone, sold by higher education to for-profit organizations, or because the network has become for-profit in its own right, or because the network has not been able to sustain itself financially and is now out of existence. The focus of the new incarnation of most of these organizations tends to be in arenas other than higher education. Not all, but many have this problem.

So what's happening at the national level? The NSF has indicated that approved universities will be able to create ".edu-to-.edu" transmissions for certain traffic. That's good, and moves us in the right direction. So too are the discussions within the National Telecommunications Task Force, which are likely to result in good solutions for the 90-or-so large research universities. These beginnings also move us in the right direction. The current discussions about Internet II, gigapops, private-sector partnerships, and the like are equally important and we need to encourage and support such initiatives.

That said, there is little in the above that helps deal with the rest of the university sector, community colleges, K-12, libraries and the like, and it is here that I think we need to quickly turn our attention. We have a very difficult problem. At the least we need a forum to discuss the problems of the larger community so that some common understandings might evolve into proposals for solutions. I'm sure CAUSE (the association for managing and using information resources in higher education), for instance, would be amenable to working something into their general agenda if there is sufficient interest. So too would FARNET—the Federation of American Research Networks. (I should probably note at this point that one of the hats that I currently wear is as President of FARNET—visit www.farnet.org if you want more information about this organization, which evolved from a group of the early NSF-sponsored regional nets).

Apologies to those who read this article looking for specific solutions to quality-of-service problems that many of us are experiencing (there are none at the moment), but I thought a brief discussion of the nature of the problem and current efforts to find solutions would be useful. ■

"Having taught a basic writing course as it moved through four different lab environments in four semesters, I've been doing a lot of thinking recently about the cost/value ratio (of technology) from a faculty perspective, wondering if the cost of learning all this new hardware and software has really paid off in terms of the increased value of my instructional offerings. I am not sure that I'm improving my teaching as much as just running in place. The new possibilities open to me are exciting, but I know I have barely begun to explore them. How do I find time for pedagogical innovation when so much of my time is consumed, semester after semester, by the need to update general handouts, translate macros, revise lab exercise disks, restructure basic class activities, simply because someone else decides to upgrade some part of the equipment my class depends on?"

Linda J. Stine
Lincoln University
AAHESGIT listserv
August 26, 1996

In Future Issues

- *Student technology assistants: cost-effective or just a big headache?*
- *Web access to administrative information: are you on this bandwagon yet?*
- *The "best practices" approach to choosing a new campus-wide system*

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EDUTECH RESPONDS

Q. We are well into an implementation project for new administrative software, and have, unfortunately, been having terrible problems. Although the number of problems is large, they seem to be concentrated in just a few areas, including software bugs and service from the vendor. Some at the institution have begun to seriously question whether we should continue to move forward this way or try to go in a different direction with different software. Are there some guidelines we can use to help us do this analysis?

A. *Of course, it depends on the root causes of your problems; to paraphrase Tolstoy, all happy implementations resemble one another; every unhappy implementation is unhappy in its own way. We do have some general advice, however. Begin your analysis with two premises: the first is that all of the reasons you chose this particular direction still apply (and probably even more so than at the beginning). The second is that all problems can be dealt with in one way or another. Our experience suggests that beginning here most often leads to a decision to keep going in the same direction, but with more effective procedures and processes in place to make it work. These might include better communications with the vendor, a more realistic set of expectations on the part of users, a greater commitment on the part of the upper administration to the necessity of change, and so on.*

Q. When we do user satisfaction surveys, the lowest marks we get are always in the area of training. But we offer lots of classes that are very poorly attended. We think the real problem is that the users don't want to take the time out of their day to attend a class. How can we convince them to come?

A. *Wrong question. The real question is, How can we provide the most cost-effective training to our users? The users are sending you a clear message: the classes don't work for them. So what will? Begin here: the ideal approach in terms of effectiveness would be one-on-one training in the users' own environments, according to the users' own schedules. Since that is usually too expensive, you need to consider how you can get as close as possible to this at lower cost. A combined approach, using some one-on-one, some video-based, and some classes, is likely to be best.*

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The Education Technology Newsletter for Faculty and Administrators

Ten Commandments for IT Groups

Howard Strauss, Princeton University

Of course there are many more than ten rules that need to be followed to run the best possible information technology group, but in the interest of precision, conciseness, and the nice metric feel of ten rules, just ten of the most important—and most often ignored—rules will be explained here. Any connection to the real Ten Commandments, which many of us also have some difficulty in following, is of course, purely coincidental.

Rule 1: You shall have no gods—except maybe your users. You certainly know that your continued employment depends on keeping your vice president for computing (or whatever title she has) happy. There are probably some other key people as well, likely your brightest programmers, and managers with the biggest empires that you know you also have to mollify. But if keeping these folks contented is more important than keeping your users satisfied, the existence of your entire organization is on shaky grounds.

Two of the most basic questions any business must answer are, "What business am I in?" and "Who are my customers?". These seem like such simple questions with such obvious answers that you probably don't think much about them. Perhaps a few of you still think that you are part of an academic organization and therefore are not in any business. Most of you, however, realize that you are in the service business, providing ways for your customers to do their work more easily and effectively.

But who are those customers you want to make so effective? Is it the management of your information technology group? The

continued on page 3

"When I think back to the dismal Introductory Economics telecourse I took twenty-five years ago, and to the many failed experiments with self-paced learning, I have certain apprehensions about the effectiveness of some forms of learning with technology. But, I must admit that I'm impressed with how far we've come in the past decade. I've seen faculty and students come alive with the creative opportunities emerging technologies can provide. I've seen many positive ways in which technology is being used effectively to reach more students, to enhance the teaching and learning process, and to improve institutional effectiveness. What's really important, I think, is having clear educational values to guide the use of technology and a clear sense of purpose."

Barbara Leigh Smith
"On Learning, Technology, and the Way We Work"
AAHE Bulletin
September 1996

NEWSBRIEFS

EXPLORE THE FUTURE AT CUMREC

The annual CUMREC (College and University Computer Users Association) conference will take place this academic year on May 11–14, 1997 at the Adam's Mark Hotel on the St. Louis riverfront. Its purpose is to explore and share solutions for the future by providing a forum for higher education professionals to share their expertise and experiences with information systems. The CUMREC Annual Conference, founded in 1956, is the longest continuing conference devoted to promoting the understanding and use of information technology in higher education. CUMREC97 will bring together information systems planners, developers, users, and support personnel, and provides a great opportunity for departmental personnel, information systems staff, and corporate partners to share technology solutions.

For more information contact CUMREC at (314) 977-9757 (voice mail), CUMREC97@sluvca.slu.edu, or http://www.cumrec.com.

INTERNET FUTURE OF RARE BOOKS

The economics of electronic versions of rare books is the subject of a two-year study being undertaken by the University of Virginia Library. Sponsored by a $400,000 grant from The Andrew W. Mellon Foundation, the project will compare usage and costs between electronic texts and original printed editions of rare early American fiction. As part of the study, 582 first editions of the most important novels and short stories will be digitized and put on the World Wide Web. Called the Electronic Archive of Early American Fiction, the on-line collection will include books published between 1775 and 1850. All the texts will be taken from rare first editions in the Barrett Collection and other collections in the Library's Special Collections Department.

A major goal of the project will be to determine if rare research materials can be made available at a reasonable cost on the Web. An important part of the project will be an evaluation phase in 1998. Teachers and students will be asked to compare factors like ease of use of original rare books and of the electronic versions of them.

For further information contact: David Seaman, etext@virginia.edu, (804) 924-3230, or see http://etext.lib.virginia.edu/eaf/.

SUMMARY OF CAUSE/CNI CONFERENCE AVAILABLE

A summary of the Southeast Regional conference "Teaching and Learning in Cyberspace," jointly sponsored by CAUSE and the Coalition for Networked Information (CNI), is available on CNI's Web server at http://www.cni.org/regconfs/www/roanoke-9609-report.html. A number of speakers at the conference affirmed the educational value of technology at a variety of levels of sophistication.

CAUSE is the association for managing and using information resources in higher education. They can be reached at (303) 449-4430, http://cause-www.colorado.edu, or info@cause.colorado.edu.

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Ten Commandments for IT Groups...

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systems gurus whom you count on to understand inscrutable software and coerce it to do your bidding? These are certainly important people and it is crucial that they have the tools they need to do their work, but they cannot be treated as though they were your most important customers.

When push comes to shove, as it so often does in an information technology group, your users must take priority over even the most important person in your own organization. That includes your VP of computing. If she doesn't realize that and believes that her organization's number one priority must be to serve her every whim, then she has elevated herself to god-like status. Except for users, your organization can have no gods.

Historically, programmers were treated as gods of technology. Their powers—compared to mere mortals who were cowed by the complexities of binary hieroglyphics—were considered so vast and their creations so amazing, that behaviors that would not be tolerated in a cranky three-year-old were accepted.

A systems maven I once knew would regularly lapse into "one-word mode." During these periods he would answer any question, whether from user, manager, or peer (oops—he knew he had no peers and we all believed it too) with a single word. If you asked him how to implement network security on a new system, he might say, "blkrst," referring to some mystical thing that only he knew.

We put up with his silliness because we assumed we could not afford to lose him. We ignored the high cost of depending upon a god instead of a regular programmer. While he turned out the most reliable and complex systems before the rest of us could even think of how to approach the problem, his systems often had interfaces and documentation that only he could comprehend. While we did our best to hide him from users, they did see his systems and the sad results of having a god on our staff.

As difficult as it might be to accept, everyone in your organization must understand that they are subservient to every user and that the entire organization exists just to serve users. In such an organization there is no room or time for local gods. Eliminating gods will not only please your users, it will do wonders for your staff.

Rule 2: You shall covet your neighbors' systems, procedures, and anything else your neighbors have or do.

It is good to know that each of us is special in some way. Our parents, teachers, employers, and maybe psychiatrists have assured us of that since the moment we were born. So we shouldn't be surprised to find that groups outside our own organization have occasionally done something better than we have, or at least good enough so that doing it again ourselves makes no sense.

When we build systems and procedures it is important not to try to do everything ourselves. Would you write your own word processing system with such good, affordable alternatives readily available? I know some of you will say, "you bet!" and start coding this instant because, after all, "How could Microsoft or Corel possibly include all the special things in their WP program that we do at Narcissistic State?"

But many of the special things we do at our special universities are done only because we once decided to do them. We continued to do them because we had always done things that way, because it became the traditional way we did things, because our users expected us to do things that way, because otherwise Narcissistic State would be just like every other university, and because it would be so difficult to change. These attitudes made little sense when we could afford them. Now that budgets are tighter, they can keep us from providing our users with the services they need.

We need to question why anything we do is different from the way other universities and businesses do similar tasks, and try, wherever possible, to change it so it isn't so. Then we must borrow ideas from all available sources— and not just other academic institutions, either. We should ask who provides the best customer support, the most reliable systems, the best software, the best working conditions for employees, and so forth, then borrow heavily—or buy— their ideas and products.

Walt Disney Inc. does superb customer support; support that would be the envy of any university information technology center. They're not a university, don't have to deal with faculty or rambunctious students, and have a hundred other differences from the place where you and I work every day. But Disney has shown excellence in doing something that we all need to do. When we see something like that we need to find some way to apply that success to our own organizations.

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Howard Strauss is Manager of Advanced Applications at Princeton University.

Ten Commandments for IT Groups...

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Rule 3: You shall kill old systems and procedures, and remove unproductive employees.
In 1987 I led a small group that created Princeton News Network (PNN), one of the first Campus Wide Information Systems and a precursor to gopher and the Web. PNN was successful beyond our wildest dreams. Universities all over the world adopted it and we lavished attention on it that befitted the precocious child it had become to us, its creators.

The appearance of gopher did nothing to deter us. We redoubled our efforts on PNN and gleefully pointed out the areas where PNN was far superior to any and all challengers. Then I was asked to lead the effort to replace PNN with gopher. It seemed like infanticide. Wasn't there some rule against killing your own creations? Even if a system was no longer the best there was, wasn't your long investment in it, your intimate familiarity with it, and your loyalty to it worth everything?

That's what universities tend to do. They hang onto ancient systems and stick band-aids on them to keep them alive. Often the systems are in need of so much help that massive renovations are necessary. These attempts to keep outdated systems alive put huge drains on scarce resources.

It may upset the psyches of the people who've devoted a chunk of their lives ministering to these old systems, but you must be ruthless in discarding systems that no longer fit. Your repertoire of systems must be more like a new car showroom than an attic.

Like systems that cannot be readily adapted to your current needs, unproductive positions and employees have a way of accumulating in your organization's attic. While reorganizations are often more disruptive than helpful, keeping your organization's structure and employees up to date is vital. Do you have a newsletter editor? Does anybody really read your newsletter? Would it be better to put it on-line or forget it entirely?

While you're cleaning out your old systems, take a look at your people and the positions they're supposed to fill. Of course you should try to keep folks you have, but if they can't adapt to the work you are really supposed to be doing, and if you have job descriptions that are long in the tooth, get rid of them. You can't afford stagnant systems, positions, or people.

Rule 4: Forget taking time off. You'll need 25-hour days to succeed.
There are many advantages to working at an educational institution rather than for a commercial enterprise. There's access to the library and athletic facilities, the intellectual atmosphere, the contact with bright young students and outstanding faculty, and the park-like campuses. *Rumored* advantages include the lack of deadlines, a relaxed working environment, and freedom from competitive pressures. If your place offers these latter benefits, you may soon become familiar with such corporate concepts as outsourcing, downsizing, and outplacement.

Your information technology organization is a business within the university. Just outside the university's walls are companies that can do many of the things your IT business does. They are your competitors, and your customers (students, faculty, and staff) are becoming increasingly aware of them.

It was once enough for a university-owned microcomputer store to offer big discounts on computers. But now dozens of commercial stores offer equally big discounts and often equally good service and support. If we want our internal computer stores to survive (and we should ask if that still makes any sense - see rule 3), they will have to work harder and offer more than their commercial competitors.

This may not seem as obvious for your help desk, network management programmers, or other parts of your organization, but they are all being challenged by commercial establishments. Much of the increased competition is because almost all of the high-tech stuff that university IT folks now do (e.g., office software, the Web, hardware and software support) has become consumer and commercial goods for which there is an enormous market. No longer are university computer centers the guardians of an esoteric trade. We now do stuff that my mother expects to do with her computer—and she gets help from commercial sources.

As a result, we must work harder and smarter than our commercial colleagues. We need to offer services and systems to our users that are obviously better and cheaper than they can buy (or force the administration to buy) from the sales people camped outside our doors.

You can still have flexible hours—as long they are long enough. But the fire in your bellies had better be as strong as it is in the bellies of the most aggressive commercial software firms.

Rule 5: You shall not take your users or your staff in vain.
If you accept the fact that you are in a competitive business, you might think you should focus on your competition and do whatever

it is they do better. But your focus should be on serving your users, not beating your competition. To do this best you need to know what they really want. This actually requires several steps; get to know them, ask them what they want, listen, tell them what you think they said, listen some more.

That doesn't end the process. Your paychecks don't really come from the Treasurer's office. They really come from the good graces of your satisfied users. Involve them in all the things you're doing for them. Sure, when you design a new payroll system you talk to the payroll department, but they aren't the only users of the payroll system. Do you talk to the faculty who want the option of home delivery of paychecks? When you decided to offer help desk services did your users play a part in deciding what services would be offered and how they'd be offered? When you decide to move to a new version of the browser is there any user involvement? Why not?

A strategic advantage you have over all competitors is that you have the ability to know your users better than any competitor could dream of doing. Take advantage of your edge. This goes for your staff as well. Just as your users have great ideas, so does your staff.

You need to encourage input and feedback. Yes, some of it will be negative, but being told you are doing something that makes your users or staff unhappy is priceless information if you use it to address their problems.

Rule 6: You shall stick to your knitting.

There are a zillion interesting things that you could be working on at a university computer center. You might even have the freedom to decide which of those things to go off and do. Of course you'll have some user-based justification ready for anything you do. For example, "Hey, most of our users have hands. I think I'll work on electronic hand recognition systems."

Your services should reflect what your users actually need, not the things you think are neat. You are a service organization, not a sand box. If knitting what your users really need bores you, you should find some other place to play.

Rule 7: You shall fix the problem, not document it.

"WARNING!", said the message at the top of the screen in large uppercase letters. "DO NOT CHECK A BOX WITHOUT ENTERING A VALUE!" Of course I wondered what would happen if I ignored the warning so I checked lots of boxes without entering any values. The result was a mess that took me hours to fix.

This system had a serious design flaw that should have been repaired. Documenting it did not fix it. Your users do not generally read documentation and are skeptical of it even if they should read it. Using a bigger font, red letters, or even blinking text does not assure that your warnings will be heeded.

Any warnings on the screen or in your documentation are a sure sign of documenting a design flaw rather than fixing it. But many systems without warnings also do this. Do you have systems that are hard to use or difficult to understand? That's a real danger signal. Writing extensive on-line documentation—however clear or full of the latest multi-media and hypertext links—is no substitute for making the systems simpler.

Whether your users buy a VCR or use one of your systems, they don't want the best documentation and the clearest warnings, they want something they can use with no documentation and no warnings. They don't want to see signs that say "Dangerous Curve Ahead"; they want the road fixed to make it safe.

Rule 8: You shall know when to break the rules—and when not to.

This the eighth and last of these ten commandments for IT organizations. Ten commandments seemed like a good idea when this was started, but now eight seems like enough information to absorb at one reading. You cannot let your rules, plans, or policies force you to do things that make no sense.

Of course you must have rules and policies or the resultant anarchy would make your organization completely chaotic. You need to keep in mind, however, that your rules and policies should be there to make your organization run more effectively. When they don't serve that purpose you must break them. If you need to break a rule often, though, it should be rewritten or removed.

Time and again organizations decide to tell users, "No" because of some rule that should be ignored under the circumstances. I have showed up a few minutes before opening time at stores full of employees checking their watches to be sure the doors were not unlocked one second early. Is their business served by trying to impress me with their precision at timekeeping? When a user needs us we should try to see if there is some way that would not hurt our organization that would allow us to help. That's the business we're in. If we are concerned about breaking some rules to stay in business we should consider the alternative. ■

Planning an IT Retreat

As our IT organizations try to cope under increasing pressure to deliver products and services in a multi-faceted environment with limited resources, more of them are taking the opportunity to stand back from it all and try to figure out "what it all means."

For a department that has been undergoing a great deal of stress, whether it is going through a reorganization, hearing a lot of negative feedback from the users, suffering major budget cutbacks, or any of a whole host of other things that contribute to stress levels, getting away from the daily work environment to discuss big-picture topics can be a life-saver. The chance to look inward and the opportunity to be away for at least a short time from the constant barrage of requests are the main benefits of a retreat, both difficult to obtain through any other means.

Logistics

The first thing to think about from a logistical point of view is whether it is necessary to have a facilitator help organize and conduct the retreat. Experienced facilitators can add a lot to the process, especially if they are familiar with the workings of IT departments. It can be someone from the institution's own Human Resources department or a professional organization-development specialist from outside the institution. If you do decide to use a facilitator, it is best not to choose someone from the IT department itself, both because you want full participation in the retreat and because you need an objective observer for this role. The facilitator does not bring any particular knowledge or judgment to the discussion, but helps sort out the major issues and hopefully, by the time the retreat is over, helps arrive at some consensus about the issues.

The place is important. It definitely needs to be off-campus somewhere (to eliminate distractions as much as possible), and many institutions do have such facilities available. If yours doesn't, there are bound to be facilities in the area that can accommodate your needs. You'll want to plan for at least two days, so the place needs to provide sleeping and eating accommodations, as well as meeting rooms.

Picking the right time (most do it during the summer or on a break—this does mean, after all, virtually shutting the computer center down) and deciding whether to have just one retreat or to do it on a regular basis are the other major logistical issues.

The chance to look inward and the opportunity to be away for at least a short time from the constant barrage of requests are the main benefits of a retreat, both difficult to obtain through any other means.

Agenda

One of the most useful agenda items for a retreat, especially for the first retreat the department has, is to develop statements for the vision, the mission, and the values of the department.

Vision is about purpose; it is the answer to the questions, "To what end do we strive? What ideal are we trying to reach with our work in the department?" Mission is about role; it is the answer to the questions, "How do we strive? Where do we fit as an organization within the institution and as professional individuals within the department?" Values are about what's most important to each of the staff members, both individually and organizationally; it's the answer to the questions, "Within what context of thinking and behavior do we strive to do our work in the department? What principles guide our behavior and what motivates us to keep working?" Developing a common set of ideas and articulations for each of these issues can be a great foundation for the department to work from after returning from the retreat.

Process

The first thing that should be done is to establish the ground rules for the retreat.

First, it is necessary to talk about and reach agreement on the fact that what will be happening at the retreat is important. This is a serious process, and while it can be enjoyable and entertaining, the purpose of this time away from campus is not extra vacation time.

Second, since the whole department will be there, it is necessary to temporarily eliminate organizational levels. This is, of course, very artificial, and it may take a while for everyone to feel comfortable with this, but a skilled facilitator can make it happen.

Third, it is necessary for everyone to be as non-judgmental as possible about what they hear from others during the retreat. Obviously, many people feel very strongly about some of the areas that will be discussed, and that's fine. But regardless of individual points of view, everyone needs to hold off as much as possible from jumping to

conclusions about the points of view of others until there has been a chance to thoroughly explore what they are.

Once the ground rules are in place, substantive discussions can begin. In order to develop ideas about vision, mission, and values, it is important to keep in mind the present day as well as three to five years into the future, and to look at issues from a departmental point of view. In the retreat setting, answering questions such as these can help develop people's thinking about these issues:

Do we have any crises at the moment? What are we most worried about? Are we well regarded in the user community? How do we know if we are? Who exactly are our customers? What groupings do we tend to put them in? What are their characteristics? What are the products and services that the institution most needs from us now? Do we expect those to change over time? What is the right behavior model for us as professionals? Are we organized correctly to meet the needs of the institution? How do we define "excellence"? Is excellence an appropriate goal for our department? How do we define "success"? What constraints does the department have toward fulfilling its goals? How are decisions made, both in the department and in the institution? What are the most important challenges and opportunities facing the institution and our department today?

After everyone has had a chance to chew on these questions and discuss possible answers, and depending on the size of the department, you may want to break into small discussion groups to begin actually working on statements of vision, mission, and values. These statements can then be brought together to develop a department-wide consensus on the final versions.

In addition to these discussions, many facilitators will have group "exercises," in order to enhance team building, trust, and communications within the group.

Follow-up

The best way to follow up a good retreat is to build upon and expand the work that was done there. Once the retreat is over and everyone has returned to their daily jobs, it's easy to forget the larger issues that were dealt with when the time was available and the distractions at a minimum. But those larger issues are very important, and should undergird the day-to-day work of the department.

Whether you use a retreat to develop new ideas, to be introspective, or just to have an uninterrupted chance to build a team environment, the retreat itself should be considered just a beginning. ■

"Hyperbole and gloom abound. Some people hope that technology will miraculously solve the access problem while dramatically lowering the costs of higher education. Others, equating technology with passive forms of distance education and loss of faculty jobs, dismiss the creative opportunities too readily. Many are simply confused about what the 'it' is and are left wondering how their institution measures up. In my own state, there has been much discussion about technology as we plan for a statewide telecommunications system. It's become increasingly clear to me that the framing of the issue and the opportunity is critical."

Barbara Leigh Smith
"On Learning, Technology, and the Way We Work"
AAHE Bulletin
September 1996

In Future Issues

- *When doing strategic planning for IT is <u>not</u> a good idea*
- *What, if anything, IT has to do with institutional quality*
- *New system implementation: basic guidelines for success*

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EDUTECH RESPONDS

Q. We're just about to begin the search for a new administrative information system, and we'll be using a campus-wide committee to lead the process. One of the things we're wondering is how you balance all of the needs of the various departments represented on the committee. There can't possibly be a system out there that does everything equally well. How do we do this without ending up with major disagreements on what the right system is?

A. *Not only is there not a system that does everything equally well, even if there were, the people on the committee would not agree on its quality. The beauty of a committee is that you get a lot of points of view. The hard part about working with a committee is that you get a lot of points of view. In spite of the latter circumstance, however, there is a way to reach consensus on a system if it is made clear right at the outset, and then emphasized throughout the process, that it is the responsibility of each member of the committee to ultimately choose the best solution for the institution. That may or may not be the system that serves one's own department in the best way possible, but given all of the factors that need to be considered, including the functionality of the system, its price, the underlying technology, the tools that come with the system, and so on, there almost always is one system that everyone can agree represents the best overall institutional choice.*

Q. Our college compares unfavorably to other colleges in our state system in the number of people in our computer center; we have more than any of the other schools, even though our college is not the largest in enrollment. As a result, we have been told to reduce staff, but I think this is a mistake. What can I use to convince the administration of their error?

A. *Making comparisons among institutions can be tricky. First you need to see if the comparison is a valid one: are all the colleges counting the same things in the same ways? If they are, then the next step is to compare objectives. An institution that is trying to make major advancements in its IT situation needs more staff than one that is remaining with the status quo—try to draw a direct link between staff numbers and outcomes. Finally, consider the possibility that you might actually be overstaffed.*

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The Education Technology Newsletter for Faculty and Administrators

Liberal Education in the Age of Technology

by Samuel R. Williamson, University of the South

Life for a college president often resembles a series of Kafkaesque choices and activities. We live in a continuously shifting state of realities in which the only predictable constant is the inevitability of more change. Each publication or media source or Internet message, whether academic or business or learned, reiterates this mantra. The Internet has changed the way we communicate and computers are finally breaking out of the science disciplines to make an impact in individual classrooms throughout the curriculum. In fact, the binary world has come to shape our entire political and even intellectual network —you are either for or against, 0 or 1.

Organizations are formed to address the change, committees on college campuses spend hours wrestling with the ramifications of this change, and everywhere the poor provosts have to find money to finance the ever-increasing costs of high technology without which their colleges will fall behind in the competitive race for students and faculty and key staff. Even the faculties are being challenged, as students often arrive on campus with more skills and more talents and more demands for service than at any point in the past. And the vicious cycle begins anew.

Where does all of this leave the small liberal arts college or university? Where do we fit into the paradigm of change, and what impact will this have upon our fundamental mission and the quality of our efforts?

Learning vs. Knowledge

Let me offer some conventional and non-conventional answers. First, I believe there is a continuing confusion about the nature

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"An important aspect of teaching is that of smoothly slipping one's own mental constructs into the minds of students. The computer facilitates this in ways unimaginable in the past. Previously, one might have had a mental model of some process, but to communicate it to students, it would have had to be turned into words, metaphors, equations, and a few line drawings.... Now one can create a computer visualization—maybe in the form of an interactive animation—which enables the mental model to be more smoothly slipped into the students' minds."

Alistair B. Fraser
"The Web, a Classroom sans Walls"
Syllabus
November/December 1996

NEWSBRIEFS

CAUSE MANAGEMENT INSTITUTE

"Professional Development—Everyone's Responsibility" is the phrase that CAUSE, the association for managing and using information resources in higher education, adopted in 1995 to highlight the emphasis that the association places on professional development in the higher-education IT field. The Management Institute is the keystone of the association's program.

The Institute will hold its two programs, one for directors and one for managers, on February 2–6 in Palm Springs, California. The Manager Program focuses more on functional management issues and is designed for the information resources professional new to management, the manager new to higher education, and the professional housed outside of the central IT department. The Director Program in general assumes that participants are experienced managers in higher education; program sessions address issues of an institution-wide or higher-education-wide nature.

For more information, contact CAUSE at 4840 Pearl East Circle, Suite 302E, Boulder, Colorado 80301; (303) 939-0315; inst@cause.colorado.edu.

MICROSOFT FORMS HIGHER ED CONSORTIUM

Seven leading higher education associations have joined with Microsoft to address the challenges of Internet integration, strategic and financial planning, and faculty training in the higher education community. The Partners for the Advancement of Technology in Higher Education will help colleges and universities address the issues and opportunities that accompany the incorporation of information technologies into higher education and offer solutions. The associations include the American Assembly of Collegiate Schools of Business (AACSB), the American Association for Higher Education (AAHE), the American Council on Education (ACE), the Council of Independent Colleges (CIC), the National Association of College and University Business Officers (NACUBO), the National Association of Foreign Student Advisors (NAFSA), and the United Negro College Fund (UNCF).

Each association will receive the latest software, networking technology, and assistance in strategic planning from Microsoft, enabling them to model for their member institutions optimal uses of leading technology and to develop solutions to technology integration difficulties, technology funding issues, and barriers to the use of technology by college and university faculty.

NEW TELECOMM JOURNAL FROM ACUTA

The *Journal of Telecommunications in Higher Education* is a new quarterly publication from the Association of College & University Telecommunications Administrators (ACUTA). It is designed to provide education and professional development to the administration, management, and staff who provide telecommunication and network services for colleges and universities.

For more information, contact ACUTA at 152 West Zandale Drive, Suite 200, Lexington, Kentucky 40503; (606) 278-3338; http://www.acuta.org.

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Liberal Education in the Age of Technology...

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of the paradigm shift, if indeed there is a paradigm shift. What is happening is less a shift of learning and education than a shift in communication and the sharing, manipulation, and dissemination of information. We have managed to accelerate the degree to which knowledge and information can be translated from one format to another, one place to another, and one discipline to another. But this change does not mean that learning itself has changed or that actual knowledge has necessarily changed.

On the other hand, some changes are taking place that do have a profound impact on modes of learning and the assimilation of skills. Liberal arts colleges have for decades eschewed, and deliberately so, the storehouse-of-knowledge approach to undergraduate education. Instead, we focus on skills, concepts, approaches, critical thinking—they have been our organizing concepts for nearly two centuries. That others are just now discovering the importance of these approaches suggests much about the history of American higher education.

What the new technologies do is free us from the secretarial function, both in research and the classroom—the literal transmission process for moving information. You might argue that this diminishes the role of the class and the lecturer, and in one sense it does. But in another sense it liberates the professor and allows him or her to focus on the class itself, to convert each class into its own tutorial, and to bring the human touch fully and firmly back into the educational experience. In that sense, whether at the large research institution or the liberal arts college, some deeper and profound changes are underway.

Furthermore the new technologies make possible economies of effort that bring enhanced quality. You now can run interactive simulations of experiments endlessly. The student can observe ad infinitum and still have time to learn. You can create situations in a small liberal arts context that would replicate much of what could be done in a major research laboratory.

Finally, we must remember that undergraduate students are one species, adult learners another, and those thrown into industrial or governmental or military contexts yet others. To suggest that there can be a common paradigm, or even a common format for each of these learners, should trigger cautionary signals, especially among those who have lived through more than one of the promised revolutions in American higher education. A failure to distinguish between these various groups can lead to some interesting cul-de-sacs.

For instance, undergraduates profess a desire to learn and their parents certainly concur. But the reality of acquiring knowledge is more jaded and fragmentary. Some students are naturally gifted learners; they would learn in any environment and many of them do. But to extrapolate—from these highly motivated students to the broader student body—that all students wish to be learners or that they can learn on their own with the assistance of the new Orwellian technology raises a note of caution. If my experience is any indication, many will want to learn, some will actually show the necessary initiative, and still others will find the technology repellent to them. Or put more simply, the assumption that we can transform and will transform all of higher education into a learning community remains to be proved. At the same time, it can be argued that the residential college for many of these students can provide a place for maturation and development that will convert them into learners. And indeed some large state universities are creating smaller programs to replicate the perceived advantages of the liberal arts college because we do just that with a large majority of our students.

Cost Reductions vs. Productivity Gains

One mistake made by many information technology advocates is to sell information technology on the basis of cost reduction. At no point in my experience has the information revolution led to cost savings. Rather it has led to increased expectations from faculty and students, to demands for ever more rapid shifts of equipment and software, and to an ever mounting increase—almost Dilbert-like—of staff to support the effort. In fact, my experience with information technology thus far has resulted in lower costs in only three discrete areas: it may help prevent you from going into some esoteric field like a foreign language that could be better done by a consortium; it may help to impose some kind of restraint on the burgeoning costs of research periodicals and other library acquisitions; and it may eventually reduce the ridiculous amounts of time that college presidents and others spend going to conferences that could ideally all be done by computers and interactive

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Samuel R. Williamson is President of the University of the South. This article first appeared in the November/December issue of Educom Review.

Computing Survey Results for 1996

Instructional integration and user support are the two most important information technology issues confronting American colleges and universities over the next two or three years, according to the *1996 Campus Computing Survey*, a national study of the use of information technology in higher education. Just over one-fourth (27.3 percent) of the 660 institutional respondents to the *1996 Campus Computing Survey* identify "assisting faculty integrate technology into instruction" as the "single most important" information technology issue at their institution in the coming years. Another fourth (24.1 percent) report that "providing adequate user support" is the top technology challenge confronting their campus. Still important but less frequently cited technology issues include "enhancing/expanding the campus network" (17.6 percent) and "financing the replacement of aging hardware and software" (17.4 percent).

"In virtually all sectors of the economy—schools, colleges, homes, and the workplace—computers and information technology have made the transition from the unique to the ubiquitous. Consequently, colleges confront growing expectations from students across all disciplines that technology will be part of the learning and instructional experience," says Kenneth C. Green, director of the study and a visiting scholar at the Claremont Graduate School in Claremont, California. "Moreover, infrastructure fosters innovation; beyond hardware, software, and computer networks, user support is also a core element of the campus technology infrastructure. Given rising demand for and expectations about technology, it is not surprising that this year's survey respondents identify the closely linked issues of instructional integration and user support as the key technology challenges confronting their institutions."

This article is based on a news release prepared by Kenneth Green, director of the Campus Computing Survey.

The 1996 survey also reveals that less than half (43.4 percent) of American colleges and universities have a strategic plan that describes institutional goals, objectives, or implementation priorities for the role of information technology (IT) in instruction and scholarship. As noted in past survey reports, few American colleges and universities have a financial plan to address the continuing problem of "acquiring and retiring" computing and IT resources.

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As of fall 1996, just over one-fourth (28.1 percent) of the nation's colleges report a budget model for amortizing and routinely replacing computers and software, up from 22.0 percent in 1995 and 15.9 percent in 1990. But even with these recent gains, the 1996 data indicate that the vast majority of colleges and universities (71.9 percent) continue to fund most of their equipment purchases and software upgrades with one-time budget allocations or special appropriations.

"More than a decade into what some have called the 'computer revolution' in higher education, it is very clear that most campuses are still operating without a strategic or financial plan for information technology," states Green. "The survey data reflect the continuing problems colleges and universities have in developing viable plans to address their escalating technology needs. Rather than plan for the routine turnover of aging technology, the budget models employed by most campuses force institutional officials to find money rather than reserve funds."

Yet Green expects the number of campuses with strategic and financial plans to increase significantly over the next three years: "External groups will push campuses to develop a strategic plan for technology: trustees, regional accrediting associations, and professional associations will require campus officials to explain their vision for information technology in the context of institutional mission and clientele. As part of the strategic plan, campuses will also have to develop detailed financial plans that provide for the timely replacement of technology resources that are increasingly important to students, faculty, and administrators."

Growing numbers of colleges are turning to user fees as one way to manage the continuing costs of enhancing and upgrading technology resources for students. This year almost a third of all campuses (31.8 percent) require a student technology fee, up from 26.9 percent in 1995. Yet this number masks significant differences across sectors: in Fall 1996 more than half of the nation's public research universities and public four-year colleges report mandatory technology fees for their students. In contrast, less than a fifth of private universities and four-year colleges have a technology fee; most private institutions apparently prefer to incorporate technology charges into tuition. Community colleges fall in the middle: about one-third (31.9 percent) currently require a technology fee from their students.

"Mandatory fees are typically spent to expand and enhance technology resources and services for students," notes Green. "Campuses try to spend this money in ways that students can see it—more and better campus computer labs and clusters, new equipment and software for existing public computer labs, and enhanced network and Internet access." The challenge, Green observes, is to retain the institutional and departmental money required to support core infrastructure needs: "Campuses that impose a student fee should use these funds to supplement, rather than replace, the institutional dollars budgeted for technology. The risk is for no net improvement in technology resources or infrastructure if the student fees begin to replace institutional dollars."

Comparatively few institutions formally recognize or reward faculty efforts to integrate technology into instruction as part of the promotion and review process. The 1996 survey reveals that 54.6 percent of the nation's colleges have some type of technology resource center intended to support the use of technology in instruction. Yet just an eighth (12.6 percent) have a formal program to recognize and reward technology efforts as a routine component of the review and promotion process.

"Review and promotion are the real test of an institutional commitment to the instructional integration of technology," says Green. "Support centers and mini-grant programs intended to promote instructional development are important. But comparatively few campuses formally recognize and reward faculty efforts to enhance their syllabi and classroom activities with technology resources." Green notes that faculty monitor the experience of their colleagues who were "early adopters." Failing to promote or to award tenure to faculty who invest time and effort into instructional integration sends a chilling message about the campus commitment to technology integration in instruction and scholarship.

> *Failing to promote or to award tenure to faculty who invest time and effort into instructional integration sends a chilling message about the campus commitment to technology integration in instruction.*

In contrast to 1995, this year's survey points to modest rather than major gains in the proportion of college courses using various kinds of information technology resources. The percentage of college classes using electronic mail rose from 20.1 to 25.0 percent, compared to 8 percent in 1994; use of presentation handouts rose slightly to 28.4 percent from 25.7 percent in 1995 and 15.1 percent in 1994. About 9 percent of all college courses currently use Web-based resources to support instruction, up from 6 percent in 1995.

But other kinds of technology resources showed little or no gains: the percentage of classes using commercial courseware was almost unchanged from last year to this at 18.5 percent, as was the use of computer-based simulations (14.4 percent of all classes).

"What seems like slower growth is more likely the consolidation of past gains," says Green. Additionally, he notes that user support plays a major role in helping faculty update and enhance their courses with IT resources. Given what some in the campus community have called the "user support crisis"—prompted by growing demands for assistance from students and faculty, the transition to Windows 95, and the explosive growth of the Internet—Green is not surprised that the pace of classroom activity may have slowed this past year.

The 1996 survey reveals that two-thirds (67.0 percent) of all undergraduates have access to e-mail and the Internet, up from 60.0 percent in 1995. Just over three-fourths (76.5 percent) of all faculty have Internet access, reflecting virtually no change from last year.

Not surprisingly, the role of the Internet and the Web continues to expand in higher education. Four-fifths (79.4 percent) of the responding campuses have an institutional Web presence, up from 55.2 percent in 1995. Almost a third of the campuses

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video. But these are all marginal savings.

The major savings cannot be realized because their achievement would tear apart the educational process itself: deep savings can only come through the reduction of faculty positions. Contrary to what most faculty believe, the real money in the college is not the administration but faculty positions. But to reduce those positions is to take away, even at the research universities, the very people who make the final difference in the educational process. In saying this I am not defending outmoded ways of doing business, or disciplines that need redefinition, or even that most holy grail: student-faculty ratios. Rather I am urging that we remember that teaching and educating are possibly different from learning, if learning is defined as simply the acquisition of skills without their utilization. Or if learning is seen as only the ability to pass certain standard sets of formalized examinations which reflect a binary and not always reflective approach.

Can we enhance "productivity"—the very term that makes faculty shudder and calls into question all of the leadership skills of an institution's hierarchy? Such gains are far more likely at the larger institutions, but obviously could help all of us insofar as we can contain our staff costs through the introduction of technologies that help with registration, with record keeping, and with the movement of administrative information from place to place. But to bolster these productivity gains, we must now encourage the teacher to use technology to free up time that can be used to guide, to assist, to formulate, to challenge, to verify, and to connect the student with the world of intellect and reflection. Nowhere is this more important than at the undergraduate level where these interactions form the heart of our educational mission and where the private liberal arts college has always and continues to make the major difference.

Coping with Change

Are we doing enough in this regard? Are our faculty ready to change roles? And where will all of this lead? "No," must be the answer to the first question. Helping the faculty to survive in this age of transition is not easy. Older colleagues feel threatened, others remember how their disciplines got shredded in the wars to establish quantitative techniques in the 1960s, and still others simply are not interested. But there are subtle peer pressures that can often move the most obdurate—have the faculty conduct its business by e-mail; offer lucrative course development grants; fund conference travel; provide technical support that can answer the most mundane problem; establish teaching centers that show how the technology can be harnessed and have it staffed with senior people who themselves have made the change; make the president at least have some sense of what is going on, if only to be a cheerleader in the operation.

The net effect of these efforts should be an enhanced quality of instruction, a deepening appreciation of qualitative improvements in the nature of the instruction and in its outcomes. And these approaches should allow more rapid assessments as to their own utility.

But there will be a downside to this momentum: the already-present drive among new and younger faculty to associate more with their discipline and their subject area than with their college will increase through e-mail and the Internet. If you are talking across the world all of the time to your fellow co-workers in the study of Austrian history, as I do from time to time, how much attention are you likely to devote to more mundane duties, such as teaching students? Also, a person who acquires the technological skills for teaching may rely more on those skills than on his or her knowledge of the discipline.

Furthermore, change for the sheer sake of change may become for the faculty member the order of the day, with teaching and its equipment and its demands becoming the overriding consideration, driving out research and all other scholarly activities. While some state legislators will probably applaud this new total attention to teaching, it will only harm the academic enterprise in the long run—a "Mr. Chips" with a computer is still a "Mr. Chips," and an institution only needs so many of them.

Or to put it another way, we can recall Isaiah Berlin's dichotomy between the hedgehog and the fox in his analysis of Tolstoy's *War and Peace*. The hedgehog knows one thing and seeks one thing, the fox chases after many things. We must remember that education and learning at their best are not training, not just learning, but the total experience of maturation, reflection, and of intellectual, even spiritual development. Liberal arts colleges have for a very long time focused their efforts on one kind of education and our strength lies in continuing to do so. Liberal arts colleges have a role in the pluralism of American higher education that has given them definable excellence in the past and is likely to do so for the foreseeable future. In this adventure, we will have some fun and make some mistakes and should never entirely take ourselves too seriously. ■

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participating in the 1996 survey (30.1 percent) report a formal campus plan for the use of the Internet and the Web in instruction (up from 24.4 percent in 1995). Over a sixth (17.5 percent) have a formal plan for the role of the Internet and the Web in distance education, up from 12.5 percent last year; well over half (56.8) have a formal plan for using the Web in off-campus promotion (admissions, alumni activities, etc.) compared to almost two-fifths (38.1 percent) in 1995.

After some caution following the August 1995 product launch, colleges and universities have begun to recommend and support Microsoft's Windows 95 operating system. Almost three-fourths (73.3 percent) of the campuses participating in the *1996 Campus Computing Survey* report that they support Windows 95, up from less than a quarter (23.3 percent) in fall 1995. As in the corporate sector, the year-long transition to Windows 95 reflects institutional concerns about significant migration costs: the need for new software, faster and more powerful computers, and additional demand for user training and support.

The rising institutional support for Windows 95 has not, however, significantly diminished current campus support for Apple's Macintosh platform. Just over two-thirds (69.7 percent) of the campuses in the 1996 survey report they "recommend or support" the Macintosh, down slightly from 72.8 percent in 1995. Yet looking forward, the 1996 data point to future gains for Windows 95 and possible decline for the Mac. Asked about the importance of Windows 95 in their technology planning over the next two-three years, campus respondents rate Windows 95 at 5.7 on a 7-point scale (1=not important; 7= very important), up from 5.4 in 1995. Windows NT rose to a scale score of 5.1, up from 4.5 last year. In contrast, respondents identified the "future importance" of the Macintosh at a scale score of 4.0 this year, down from 4.5 in fall 1995.

The annual *Campus Computing Survey*, now in its seventh year, is based on data provided by computing officials at 660 two- and four-year colleges and universities across the United States. Participating campuses completed the survey during summer 1996. Copies of the 1996 report are available for $35 (postpaid) from Kenneth Green c/o Campus Computing; PO Box 261242; Encino, CA 91426-1242. (Tel: 818/990-2212; Fax: 818/784-8008; cgreen@earthlink. net). ■

"If the computer offers advantages over the pedagogical technology of previous generations, what are they? That there might be any at all is not entirely obvious to most participants in classes or seminars for which the presenter has—as he might unfortunately put it—computerized his lecture.... The problem is that the material being presented has been cribbed from the yellow pads of paper previously used to assemble notes for the blackboard. Nowhere apparent is there any pedagogical value added as a result of the availability of the more powerful platform. Nowhere apparent is the realization that the constraints upon communication have receded."

Alistair B. Fraser
Penn State University
"The Web, a Classroom sans Walls"
Syllabus
November/December 1996

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In Future Issues

- *Strategic planning: a basic, step-by-step approach*
- *Pitfalls in new system implementations: what to be especially careful of*
- *Reorienting the IT department from data processing to customer service*

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EDUTECH RESPONDS

Q. There's a lot of talk about a "support service crisis" in higher education these days, referring to the huge growth in demand for IT services, especially among the faculty, generally unaccompanied by a corresponding growth in the IT department to provide those services. As a result, IT-department-bashing has certainly become the sport of choice on many campuses these days. Is there anything we can or should do about this, or is this a normal stage in the maturation of institutional awareness about how to handle IT as an important resource?

A. *Some of each. Something certainly has to be done to lessen the crisis nature of this situation, as high turnover rates, burned-out staff, plummeting morale, and every other higher ed computer center director looking for a new job take their increasingly heavy toll on institutional effectiveness. One of the key issues is expectations (often unrealistic on the part of the administration and the user community), and the role that the IT department has in shaping those expectations (usually bigger than the IT department thinks). Thus, the IT folks can actually help the institution move along to the next stage of IT awareness while helping themselves out of the crisis. Look for upcoming newsletter articles addressing some techniques for shaping expectations.*

Q. We're still struggling on our campus with the age-old question of centralization versus decentralization of IT services. Several of our colleges and departments want their own IT folks (both administrative and academic), but I still believe there is much to be gained from economies of scale and the synergy that happens in a centralized service department. How do I make this case?

A. *Yes, there is much to be gained from centralization—in terms of efficiency. What may be being lost, however, is effectiveness. No one knows better than the end users themselves what they want and need (even though they may not always express it in IT terms), and the closer the support services, the more likely they are to get what they need. What more institutions are turning to is a hybrid approach, with support people who actually "live in" and report to end-user areas, but with dual reporting to the central IT department to maintain the synergy.*

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Information Technology Strategic Planning

Strategic planning is often an area that gets paid more attention to in a theoretical way than in a practical way. That is, planning is an activity that most higher education IT professionals know is important, but not many yet have an actual process in place that leads to the creation of a real plan. Planning is both difficult and time-consuming, but perhaps most pertinent to its failure to be embraced as a real activity is the all-consuming nature of a typical IT manager's day-to-day duties. Often, there just isn't enough energy left over after a long day of coping with the institution's immediate demands for IT services to do planning. Nevertheless, it is an increasingly important part of an IT manager's responsibilities, so in order to make the process as unburdensome as possible, we offer here an outline of the specific steps needed to create an IT Strategic Plan.

By way of introduction, consider what one of the "gurus" in the field of IT strategic planning for higher education, James Penrod, Vice President for Information Systems & Chief Information Officer at the University of Memphis, and on whose ideas much of this article is based, has identified as the elements of a successful planning process: the support of the senior administration; an understanding that planning is a continuous, on-going process; the involvement of both users and IT staff; and the goal of having the plan itself be driven by institutional problems and opportunities, not by technological developments. Each of these factors is extremely important, and the likelihood of creating a good plan without any of them is low.

The process basically involves four steps: preparing to plan, gathering information for the plan, creating the plan, and having the plan endorsed and approved.

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"Many information technology managers feel that their only major responsibilities are customer service, running a good shop, and seeking some small but continuous increments of improvement. They have underestimated the requirements for technology leadership. Just doing the same job better is not going to be a successful strategy. While it may be true that customer and management expectations are too high, these expectations are real."

Bernard W. Gleason
"Managing Ideas"
Reflections on Leadership
CAUSE Professional Paper #15
December 1996

NEWSBRIEFS

LEARNING, TECHNOLOGY, AND THE WAY WE WORK

"Learning, Technology, and the Way We Work" is the theme of this year's national conference on higher education sponsored by the American Association for Higher Education (AAHE), to be held in Washington, DC on March 15–19. Sessions will include "Why Universities Need Technology Strategies," "Beyond Enhancement: Using Technology to Raise Quality and Reduce Costs," "The Real Benefit: Technology as Powerful Pedagogy," "On Technology and Connectedness," and many other topics. There will also be teaching, learning, and technology tutorials; a videoconference on "Learning, Technology, and Students of Color: Mastering Access and Opportunities"; professional-development workshops; and caucus meetings.

For more information, contact AAHE at One Dupont Circle, Suite 360, Washington, DC 20036; (202) 293-6440; http://www.aahe.org.

EDUCOM PAPER ON INSTRUCTIONAL SOFTWARE NOW AVAILABLE

In spite of significant efforts at cost cutting, higher education costs are rising at two to three times the rise in the consumer price index while questions of quality persist. In response, the public is increasingly asking: What is the value received for the dollars we invest in higher education? Experts from higher education, industry, and government joined representatives from Educom, the association for transforming education through information technology, at the Broadmoor Hotel in Colorado Springs, Colorado on July 25–25 for the second in a series of Educom roundtables; this one to explore the possibility that instructional software can have a significant impact on productivity in higher education. A white paper, "Academic Productivity: The Case for Instructional Software," reports on the outcomes of this meeting.

Authored by Educom vice president Carol Twigg, the paper presents five propositions developed by the roundtable: 1) instructional software is essential if we are to solve the productivity crisis; 2) targeting areas of high student demand will have the greatest likelihood of success; 3) colleges and universities cannot create requisite software on their own; 4) what is needed, in the words of author and futurist Lewis Perelman, is "self-sustained commercialization; and 5) market success depends on instructional software that is disaggregated, disintermediated, differentiated, and diffuse.

Higher education's initial attempts to integrate technology into academic programs have followed what Twigg calls the "bolt-on" approach. "So far," she writes, "most IT-based improvements have involved doing more with more. Some increase access and some improve quality but few control costs." Instead, she warns, those applications simply "bolt on" to the traditional classroom structure, thereby adding to the cost of instruction. She believes that quality instructional software coupled with changes in practices is needed to create less labor-intensive models of teaching and learning.

The paper is available for $5.00 per copy through Educom, 1112 16th Street NW, Suite 600, Washington, DC 20036; (202) 872-4200; kbullers@educom.edu.

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New CAUSE Publication and a Terrific Conference

CAUSE, the association for managing and using information resources in higher education, has just published the fifteenth entry in the Professional Papers series. *Reflections on Leadership* is a collection of essays from the seven winners of the *ELITE* Award for Exemplary Leadership and Information Technology Excellence: Thomas West of the California State University System Office ("More Lessons From the CIO Trail: from Butch Cassidy to City Slicker"); Bernard Gleason of Boston College ("Managing Ideas"); Carole Barone of the University of California, Davis ("Leading Through Influence"); Robert Heterick of Educom ("Maybe Adam Smith Had It Right"); Albert LeDuc of Miami-Dade Community College ("Organizational Leadership: Characteristics of Success and Failure"); Brian Hawkins of Brown University ("Leadership in a Service Environment"); and Patricia Battin, retired president of the Commission on Preservation and Access ("Making It Happen; Leadership in a Transformational Age").

What these award winners have in common, in addition to their ability to write well (so that reading their work is not so much a duty as it is a joy), is that they are speaking from the special—and rare—perspective of successful IT leaders. As Polley Ann McClure says in the introduction: "Each of these individuals has effectively led organizations that deliver information resource services..., all have advanced the capacity of these institutions to better perform their missions through information resources, and they have contributed powerfully to the advancement of our ability to manage information resources on a global scale through their professional activities." Do we have much to learn from them? Oh, yes. Especially in this uniquely troubled time of such high turnover among IT managers, great frustration in all quarters, and a widening sense of insecurity about one's position and one's role within the institution. Yes, we have a lot to learn from those who have made it work so well in a profession that gets harder and harder every year.

Both this paper and the December conference in San Francisco were designed to celebrate CAUSE's silver anniversary. It's almost mind-numbing to think about all the changes that have taken place in higher education information technology over the last twenty-five years (and in its professional management), but one of the best things about CAUSE is that it has adapted itself so well through the years to the needs of the profession it so ably serves. From its first day, CAUSE has been an incredibly important resource for higher ed IT managers, including its library materials, its professional development programs, the annual conferences, its publications (*CAUSE/EFFECT* is an especially valuable publication), its affiliation with other higher ed organizations, and, of course, the CAUSE staff. All world-class.

What these award winners have in common, in addition to their ability to write well (so that reading their work is not so much a duty as it is a joy), is that they are speaking from the special—and rare—perspective of successful IT leaders.

The sessions at this year's conference (playing to a record-high audience of 2,800) were, as usual, informative, and in some cases, even provocative. This year's award winners included the aforementioned Pat Battin (*ELITE*); the University of Oregon and California Lutheran University for Excellence in Campus Networking; the University of California at Berkeley, Boston College, and Valley City State University for Best Practices; and Elazar Harel and Greg Partipilo of the University of California at Los Angeles for the *CAUSE/EFFECT* Contribution of the Year for their article, "Reengineering Beyond the Illusion of Control."

Session tracks included policies and standards; IT organizations and strategic partnerships; customer-centered services; distributed computing and network technologies; innovations in technology; the learning organization; networked information; and teaching, learning, new media and the Web, so there was something for everyone.

Vendors abounded too, of course, and the vendor booth area was an even more interesting place to visit this year than usual because of the rumors about who was buying which software company or which vendor had the newest module. To say the higher education software marketplace is volatile at the moment is putting it very mildly.

For those who could not make it to the conference, or for those who were there but didn't get to see it all, check out the CAUSE Web site at http://www.cause.org. There are electronic versions of many of the papers, opportunities to get audio cassettes, and even photos of conference participants. ■

Information Technology Strategic Planning...

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Preparing to plan

Strategic planning requires a lot of time and effort from a variety of people, so it is best not done in an ad hoc fashion. That is, time and other resources need to be specifically allocated to creating the plan, and individuals should be identified with specific responsibilities.

The first thing that needs to be done is to create or receive a mandate from the top administration (ideally the president) that an IT strategic plan is necessary and should be completed within a certain amount of time. The second thing is to identify the planners. The core planning group is often drawn from the institution's Information Technology Policy or Steering Committee, if there is one. In any case, you want to make sure that the planning group has on it wide representation from across the institution and that the planners themselves are credible and influential within the community.

Once the planning group is in place, the best way for them to begin their work is to create a "Plan to Plan." This is for the purpose of developing agreements on what the specific planning steps will be, who will do what, and how long it will take.

The "Plan to Plan" is usually made up of the following sections: 1) The initial agreement: this section covers what this plan is, why it is being done, and what the goals for the plan are; 2) Mandates and regulatory agencies: this section lists other documents that the plan is closely related to, such as the institution's own strategic plan or documents that are part of the institution's budgeting process; 3) The process of planning: this includes identifying the planners, describing the role of all existing IT committees in the planning process (such as reviewing all plan drafts), describing communication channels, especially for input, between the official planners and all of the departments at the institution, identifying who will write the drafts of the plan (usually either the Chair of the Planning Committee or the CIO), and delineating how drafts of the plan will be distributed and how the rest of the community will be kept informed; 4) Timetable: this section discusses a specific timetable for the first run-through of the process, and identifies any necessary tie-ins to other processes, such as the annual budget cycle for the institution; 5) Review and modification: this outlines how evaluations of both the planning process and the progress toward plan objectives will be conducted, including whether projects are on schedule, whether the users are being understood, and whether IT staff are performing to their potential and optimal levels (feedback on these and other similar issues may lead to modifications in the planning process); 6) Reports: this names the primary planning document that will emerge from the planning process, and other documents are identified as well, such as one- or two-year plans that support the strategic plan, annual reports that address yearly activities in retrospect, and so on (you may also want to associate the strategic plan with both employee performance reviews and user satisfaction surveys); 7) Resources: this section identifies the specific people who will be involved in this effort (outside of the committees), such as the CIO, others in the Information Technology department, and others on campus (some institutions have a full-time planner).

Gathering information for the plan

Once the "Plan to Plan" is complete, you are ready to begin gathering information for the plan. The actual gathering should be done by the planners, and the information they will need falls into five categories:

Strategic objectives for the institution. If the institution has a written strategic plan, then it will be the basis of this category of information. If there is no such plan, then the Chair of the Planning Committee and the CIO should interview the institution's officers to collect and understand what the institution's objectives are. Such things as increases in enrollment, new construction projects, new educational programs, distance learning initiatives, and so on, are all examples of strategic objectives that will impact, or be impacted by, the course of IT at the institution.

End user needs and objectives. The planners should divide up the user community into logical groupings and working primarily through other IT advisory groups, such as administrative and/or academic technology committees, collect information on the major initiatives needed or planned by the user community for the next three years. Such things as increasing the number of mediated classrooms, using the World Wide Web to access admissions applications, improving the ratio of students-to-computers in public labs, and putting kiosks around campus for student access to administrative information are examples of items in this category.

External technological trends. Of course, making predictions about technology is fraught with difficulty. But there are some identifiable trends, especially in the specialized environment of higher education, that most people feel will have at least some impact on every institution, such as the eventual disappearance of centralized, main-

frame-based computing in favor of more user-oriented architectures, such as client/server; more people wanting access to more information, regardless of where or how it is stored; more multimedia use in instruction; more user control; more purchased systems and less developed in-house; change in focus for computer people from development to user support; universal connectivity; and an emerging one-to-one ratio of people to computers.

The institution's technological situation and outlook. The IT department should put together its own list of needs for the next three years, usually having to do with infrastructure items, such as broad-scale networking and mainframe/desktop hardware replacements and upgrades.

Budget information. The planners need access to all relevant institutional budget information, including forecasts for future years.

Creating the plan

At this point, the planners should now have everything they need to create the plan itself. This may be done as a draft one or more times, circulating the draft each time for comments.

In addition to the written expression of all of the material gathered in the information-gathering stage, the plan should consist of three major sections, as follows:

Vision, mission, and values of the IT department. These are the basic guides for the IT department, and are often developed and articulated through a group process, such as a retreat. Vision is about purpose, mission is about role and values are about what's most important to each of the staff members, both individually and organizationally. Developing a common set of ideas and articulations for each of these issues is a necessary foundation step for the IT department to fulfill its potential for the institution.

Sources of input can include department self-studies, consulting reports, and client satisfaction surveys. Or you may want to use a more interactive and dynamic process, which can be conducted in a variety of ways and is often led by a professional facilitator. [See the article "Planning an IT Retreat" from our October 1996 issue.]

In order to develop ideas about vision, mission, and values, it is important to keep in mind the present day as well as three to five years into the future, and to look at issues from a broad point of view. Doing a Strengths-Weaknesses-Opportunities-Threats (SWOT) analysis can help develop people's thinking about these issues.

Behavioral objectives for the IT department. This puts the vision, mission, and values into action and behavior, and lays out the basic service level agreements that the IT department has, or will develop, with each major user group on campus. Service level agreements should be quantitative standards against which the provision of computer services can be measured and evaluated. They should answer such questions as: How many hours of programming are available? How many microcomputers are supported by the department and how many can be installed in one week? How many hours of online access to administrative systems are there each week? How many hours each week are the public labs open and staffed?

Strategic, tactical, and functional strategies: a three-year scenario, with budgets. This is the heart of the matter, and the part of the process that depends on everything that has come before it. It consists of having the planners take all of the input that has been gathered and developed thus far, and create a plan that best meets all of the various objectives. Naturally, not all things can be done in a three-year time period, nor can all wishes be fulfilled. It will be the job of the planners to assign priorities, deal with budget limitations, and balance all of the needs as well as possible.

The planners will want to come up with some criteria to use to determine priorities, such as the following (in use at many institutions): 1) supports or contributes to the institution's central mission; 2) fits with the general character of the institution; 3) fits realistically with funding bases of the institution; and 4) represents a recognized area of demand, interest, or opportunity.

Having the plan endorsed and approved

Once the plan is complete and has been circulated for comments, additions, and amendments, you'll need to have it formally approved by the President and the Cabinet, and then made part of the budget process.

It's a challenging and time-consuming process, to be sure, but a very worthwhile one. It's best to remember that, as you go through this the first time, nothing is set in concrete. You'll want to adapt everything to the dictates of your own environment, and make sure that the process fits the institution, not the other way around. Also, don't expect perfection the first time; each time you do it, the process will look a little different, and a little better. The other thing to keep in mind is that the process of planning is just as important—if not more so—as the plan itself. ■

The Curriculum Has Run Its Course

by John Gehl

I owe the following notice from the Prague government to alert writer Neil Postman, who repeats it (in *The End of Education*) as an example of what happens "when those with the power to enforce definitions go mad":

"Because Christmas Eve falls on a Thursday, the day has been designated a Saturday for work purposes. Factories will close all day, with stores open a half day only. Friday, December 25, has been designated a Sunday, with both factories and stores open all day. Monday, December 28, will be a Wednesday for work purposes. Wednesday, December 30, will be a business Friday. Saturday, January 2, will be a Sunday, and Sunday, January 3, will be a Monday."

Well, yes, but that kind of thing only happens in Prague—right? Wrong. I'm writing these words in a rental beach cottage that is required by law to have an exit map posted in each room so that guests (or, at any rate, guests with sight) will know how to get out in case of fire—as though this tiny cottage were a Disney World hotel! Just six inches to the right of the door leading outside there is a map that will direct you to the door leading outside. That's correct, six inches. Well, absurd but harmless, one might say; on the other hand, one might say that absurdity is not something that people ought to get used to.

As Joseph Heller famously made clear in his classic novel, *Catch-22*, the worst kind of absurdity invariably comes from bureaucrats. Oh, sure, there are plenty of absurdities spawned by plumbers, engineers, programmers, and sales people, but the real whoppers always come either from professional bureaucrats or amateur bureaucrats —such as faculty—or such as, let's face it, you or me when we're given a spare moment and half a chance to be pompous and stupid.

I remember a faculty meeting some years ago that devoted more than an hour to an angry raised-voice debate over whether two computer science students in their final quarter of study should be allowed to substitute Physics 5566 ("Physics For The Hoi-Poloi") for the required Physics 5677 ("Physics For Physicists and Advanced Physics Burnouts"). The two young persons, both of whom were very good students, weren't trying to pull a fast one; their only motive for the substitution was to graduate in the Spring, and the required physics course wouldn't be taught again until the Fall.

> *In the age of the computer, lock-stepped educational programs are at best quaint and at worst stultifying. The curriculum is dead.*

I can no longer remember how the students' petitions were decided (shame on me), but the point is not the particular outcome of the faculty debate but the fact that in that dreadful and eternally long discussion there was no evident concern expressed by the faculty over these students (shame on the faculty). The acrimonious debate was not about what the two young persons knew or didn't know; nor about what kinds of careers the two were headed for; nor what kind of lives they wanted to lead; nor even about who the kids were; no, the debate was entirely over the question of whether making an exception to the curriculum requirement would set an evil and fatal precedent leading to public scandal and a precipitous decline in the department's excellent reputation, and an end to civilization.

I should admit that one of the junior faculty did try to explain that whatever "precedent" might be set by the case would not last more than the length of the flame on a match stick in a high wind, since the whole curriculum had just been completely revamped for implementation in the Fall—and so the faculty's decision could never affect another living soul other than the two students in question. Although this ill-mannered trouble-maker was not immediately ejected from the conference room, the only effect of his ill-advised observation was to destroy whatever slim chance the poor fool might otherwise have had to be awarded tenure. He was gone a year later. (By the way, in the revamped curriculum, neither of the two physics courses was required for computer science majors!)

As I say, I don't remember the ultimate resolution of the issue, but I do remember that the case was not decided at the end of that first, hour-long debate; instead, we broke up for lunch, and I happened to be meeting a good friend who was a senior professor at another institution. I explained to him the facts recited above (but without revealing my personal disdain for the proceedings), and I asked him to

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John Gehl is editor and publisher of Educom Review. This article is based on one that first appeared in the November/December issue.

tell me what he thought about the case. Well, he thought this and he thought that, and he wouldn't get to the bottom line, until I demanded impatiently: "Just tell me what you think we ought to do about the two students." Still unsure of himself, my friend, a man of wisdom, substance, and stature, said sagely: "It depends." Ah. We were starting to make some progress. "Depends on what?" I persisted. "It depends on whether you want to help them or you want to screw them."

And, that, of course, is the correct answer!—at least in the sense that it makes some slight reference to the students as individual living breathing human beings—a fact that had been unbearably absent in the tedious, petty, rule-obsessed bureaucratic debate that had shot the best part of a lovely Spring morning and soured the mood of everyone.

Does this have anything to do with the use of information technology in education? Well, it better. (Or what's the point of information technology?)

Technologists (some of them) got a bad name in World War II for saying "we just sent the missiles up, we didn't know where they were supposed to land." But that won't do. Delivery systems are important, but consequences are even more important, and the consequences of information technology should be to make education better (not just delivered by a different crowd of people—"the computer people" rather than "the non-computer people" or "the pre-computer people").

Can computers replace the mentoring function of an excellent, caring teacher, who gives a student close personal attention? Of course not. Can a computer be used to replace the hideous bureaucratic curricula imposed in academic institutions of all types? Yes, yes, a thousand times yes!

I realize that I'm probably out of the loop on this, but I think it's time to start talking less about information *infra*structure and more about information *meta*structure; less about protocols and more about purpose; less about the *where and when* of education (breaking down walls of time and space) and more about the *what and why* of education (breaking down walls of bureaucracy so that individuals are treated as individuals rather than cattle).

The curriculum has run its course. Not in the sense that it isn't useful as a recommended path to certain goals; but it's insane to reduce those goals to a mumbo-jumbo of rules, prerequisites, and conditions, or to continue imposing cattle-shoot curriculums on human beings—*as though they were somehow all going to learn the same stuff!* What someone knows is as idiosyncratic as a fingerprint; there are no two people on earth who know exactly the same stuff! Why pretend otherwise?

In the age of the computer, lockstepped educational programs are at best quaint and at worst stultifying. The curriculum is dead. Long live the age of the individual—and the computer. Let's let students build their education the way they build their resumes and the way they build their lives—as unique human beings. ■

"There are many characteristics of a good leader, including being a visionary, a planner, an organizer, a delegator, a technical expert. But in this new era of cultural change on our campuses, three leadership characteristics are now mandatory: decisiveness, willingness to take risks, and effective communications skills."

Bernard W. Gleason
"Managing Ideas"
Reflections on Leadership
CAUSE Professional Paper #15
December 1996

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EDUTECH RESPONDS

Q. We're in a very big hurry to choose a new administrative system and as chair of the selection committee, I don't see any reason that we can't do this in a couple of months, rather than using the long, drawn-out process that I've seen in a lot of other colleges. Is there anything in particular we should watch out for if we move this along rather rapidly?

A. *The mechanics of a good process are likely to take more than a couple of months, what with preparing a needs analysis, sending out requests for information or proposals, giving the vendors sufficient time to respond, arranging on-campus demos, checking references, and so on. But much more important than the time required to gather enough information to make a good decision is the time needed to generate consensus around the single solution that is most right for the institution. This consensus can mean the difference between a successful and an unsuccessful implementation, and needs to be generated and nurtured at every step of the selection process. That takes time, but it is an investment, rather than a cost, that reaps major rewards later on. Besides, what's the hurry? Even an institution that has major problems with the current situation and needs a replacement solution as quickly as possible needs to consider that this is a major, long-lasting, high-impact, and expensive step to take, and should go about the selection process very carefully and deliberately. Keeping the time short shouldn't necessarily be a high priority.*

Q. Is it my imagination, or are there more IT managers getting fired these days? Even colleges and universities that have been reluctant to actually fire anybody in the past seem to have gotten very bold in this area, at least.

A. *Especially if one counts all the departures that are called resignations but are actually not, then you are right in your observation. Demand for IT services is at an all-time high, resources in many places haven't kept up, the necessary structural changes that are needed to make IT a success are often not in place, and many IT managers have not developed or kept up strong relationships with the community. All this can add up to CIO standing for "Career Is Over." Hopefully, this is a short-lived phenomenon.*

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A Neo-Luddite Reflects on the Internet

Gertrude Himmelfarb, City University of New York

On the subject of our latest technological revolution, cyberspace, I am a neo-Luddite. Not a true Luddite; my Luddism is qualified, compromised. I revel in the word processor; I am grateful for computerized library catalogues; I appreciate the convenience of CD-ROMS; and I concede the usefulness of the Internet for retrieving information and conducting research. But I am disturbed by some aspects of the new technology—not merely by the moral problems raised by cybersex, which have occupied so much attention recently, but also by the new technology's impact on learning and scholarship.

Revolutions come fast and furious these days. No sooner do we adapt to one than we are confronted with another. For almost half a millennium, we lived with the product of the print revolution—the culture of the book. Then, a mere century ago, we were introduced to the motion picture; a couple of decades later, to radio and then to television. To a true Luddite, those inventions were the beginning of the rot, the decline of Western civilization as we have known it. To a true revolutionary, such as Marshall McLuhan, they were giant steps toward a brave new world liberated from the stultifying rigidities of an obsolete literacy. To the rest of us, they were frivolities, diversions, often meretricious (as some popular culture has always been), but not threatening to the life of the mind, the culture associated with books.

Not that the book culture has been immune from corruption. When the printing press democratized literature, liberating it from the control of clerics and scribes, the effects were ambiguous. As the historian Elizabeth Eisenstein pointed out in her seminal 1979 work *The Printing Press as an Agent of Change*,

continued on page 6

"We should end up with a much more efficient use of faculty time once we take the traditional role of faculty and reexamine it in light of what technology can bring to the process. That's going to happen with or without a Virtual University. Going beyond that to the idea of a Virtual University, we'll see an important new way of delivering the educational experience."

Roy Romer
Governor of Colorado
"A Matter of Degrees"
Educom Review
January/February 1997

NEWSBRIEFS

INTEGRATING IT TOOLS IN INSTRUCTION

The *Horizon Home Page* is calling for manuscripts for a Web-based on-line monograph that discusses information technology productivity tools that can enhance the teaching/learning process. The call for manuscripts is for examples, success stories, rationale, and tactics of how faculty members have incorporated technology in their instruction. The objective is to provide guidance to faculty members who wish to begin using such tools.

To participate, e-mail James L. Morrison (morrison@unc.edu) a manuscript proposal describing your course, your students, the technological tool(s) you have used, your pedagogical approach, lessons you learned, and your recommendations for applications of information technology. Proposals will be posted in the "Integrating Information Technology Productivity Tools in Instruction" section of *Horizon Home Page*. The intent is to offer an on-line monograph by soliciting critiques and reviews of drafts (via the discussion board). The page can be seen at http://sunsite.unc.edu/horizon/mono.

NETWORKED INSTRUCTIONAL TECHNOLOGIES NEWSLETTER

New Chalk is a bi-weekly electronic newsletter jointly produced by two divisions of Information Technology Services at the University of North Carolina at Chapel Hill: Academic Technology and Networks and the Institute for Academic Technology. *New Chalk* explores the uses and applications of networked instructional technologies from a faculty perspective. Each issue focuses on real, practical examples of how instructors use technology in their teaching; recent articles have included "Building the Syllabus," " Encouraging Student Use of Internet Resources," "Online Testing," and "Promoting Community."

While the emphasis in on models from the University of North Carolina at Chapel Hill, other instructors may find interesting ideas for their own institutions. There is a discussion forum as well. To access the latest issue and all back issues, see http://www.unc.edu/course/newchalk/.

TECHNOLOGY AND STUDENTS OF COLOR

"Learning Technologies and Students of Color: Strategies for Enhancing Access & Opportunities" will be the topic of a live satellite broadcast, scheduled for March 17, co-sponsored by *Black Issues in Higher Education* and the American Association of Higher Education. Questions to be addressed include, What new technologies are being created today to help students of color learn in the year 2000 and beyond? What will the new learning technologies mean for college teaching and the role of the academician? What implications will these changes have for pre-collegiate education?

For more information, contact Maya Matthews, *Black Issues in Higher Education*, (703) 385-2981; maya@cmabiccw.com.

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Streamlining Administrative Processes

by Gretchen Weir, University of Michigan

We at the University of Michigan are moving toward the 21st century with the intent of strengthening our position as a world-class university. This requires change in many aspects of University life, including teaching, learning, research, and public service. To succeed, we must streamline our administrative processes as well. Unless we provide services that support the business of learning and teaching, students, faculty and research money will go elsewhere.

The M-Pathways Project is the result of the University executive officers' commitment to revamp our business processes and information systems. The project involves not just implementing a new computer system, but rethinking the way we do things. The project's goals include: improve processes, simplify policies, and eliminate policies and procedures that do not add value; change the organization to support innovations in policy and procedure; create a new technical and data infrastructure to support the University's administrative processes; and capture data at the source and share it to support decision making. M-Pathways will not only change how we collect and use information in every area; it will also influence how we think about our organization.

There are both external and internal reasons for taking on this difficult project now. The pressures from outside are obvious to many of us. While the mission of the University hasn't changed, the environment around us is changing rapidly. We face increased competition for faculty, students, and staff. Our peers no longer live down the street, or across the state, or even in this country; global changes are demanding agility and effectiveness at home. We no longer have the luxury of doing things our way or the way they've always been done. The people we work with, whether grant administrators, service providers, or potential students and faculty, expect us to conform to new standards of efficiency.

We have internal motivations for change, as well. Many of the computer systems that support our financial, student, and human resources operations and some of the smaller systems that help units keep records are not easily modified to meet new needs. Some of these systems are difficult to use, and because of many modifications, are idiosyncratic. Training people is time consuming. The University could spend a great deal of money on numerous small-scale fixes to these systems, but the result would be no improvement in how efficiently we do our work.

> *Unless we provide services that support the business of learning and teaching, students, faculty and research money will go elsewhere.*

Over the next three years, project teams made up of representatives from the schools and colleges, as well as central offices, will document how work is currently done and recommend improvements. A variety of methods will be used to elicit comments and suggestions about the kinds of information needed to carry out those tasks. Armed with the specific data requirements, the M-Pathways project teams will adapt a set of flexible business applications provided by a commercial software vendor. The result will be an integrated information system that will capture and share information necessary to departments, schools, colleges, and the institution as a whole.

Every area of the University will be affected by M-Pathways. For example, students will benefit from systems that share information they originally entered when applying to the University. That same information can be used when they apply for financial aid, pay tuition, earn a degree, or change their course of study. As personal information changes, students will be able to notify the University of those changes with a single entry, using a computer at home or on campus. Students will have access to grades and transcripts and class assignments as they do today, but the services will be expanded. In addition, faculty will benefit from having student information more readily available. It will be easier to enter grades and get class lists. Units will be able to track the use of rooms and equipment, allowing more efficient sharing of resources. Researchers will be able to prepare, submit, and manage grants electronically.

Is any information system perfect? No. Can one system meet everyone's needs? No. M-Pathways is designed, however, to span all areas of the University so that we can find the common needs and service them in an efficient way. ■

Gretchen Weir is Communication Coordinator for the M-Pathways project. For more information, see http://www.umich.edu/~mpathway.

Keeping Your Sanity During a Conversion

If you're setting out on an administrative system software conversion project, you might do well to go see a movie like *Father of the Bride* to get into the right mood. Implementing a major package has a lot in common with planning a wedding. There are a million details to handle. It takes a long time. It's expensive. A lot is riding on the outcome. If you're lucky, the participants are not too worn out to enjoy the big party that comes when the deadline is finally met.

But it's good to remember that the important thing is the marriage, and most of that comes after the wedding. It's healthy to keep your vision focused all along on the new life that will begin only after "going live." Also, giving some thought beforehand to the surprises you may (will) get as the long months of preparations roll on will help keep your sanity.

How will life be different? ——
Although it may seem backwards to start here, it is a good idea to keep an eye on what life will be like after the conversion. That will help in making good decisions during the implementation. For example:

Data will be more accessible to more people. You will need to think about policies for confidentiality, security, and proper use. If your new system is integrated, just doing a name search may put many people in daily contact with information like birth dates and social security numbers that would have been restricted to just one office before.

More tasks will be done in the functional areas. The tasks may take longer than they did under the old system, because more data or more complex kinds of data are being entered. Will staffing have to be adjusted? How can people be involved now in planning for the changes that will affect them? Even people who won't be affected will be worrying about how the new system is going to change their jobs.

More responsibility for operations will fall to the functional areas. Making sure that the right people are ready to accept responsibility for assuring things happen correctly and at the right time will help a lot later on. Some areas that used to rely on a report arriving like clockwork from the computer center may have to adjust to their new ability to run the report themselves when they need it.

> *Implementing a major package has a lot in common with planning a wedding. There are a million details to handle. It takes a long time. It's expensive. A lot is riding on the outcome.*

Printing can be distributed. What effect will that have on work patterns? Will budget adjustments have to be made for toner, paper, labels, other supplies? You need to consider all the pros and cons of distributed printing.

More data will be on people's desktops. It is important to make sure that user offices are prepared to deal with the confidentiality and security of that data. Such things as making backup plans for key files is something end users will need to get used to and have become part of their daily routine.

Nothing can go wrong... ——
It is really important to set realistic expectations, especially for folks who have not been through this before, and who may have an active fantasy life about everything working perfectly the first time. Everything will take longer than you think and preparing for work overruns is another thing that can help keep your sanity. Some of the other things that can go wrong:

The data could turn out to be difficult to convert because it is not in the same format that the new system requires. Cleaning up the data could turn out to be a bigger job than anticipated. Would it be better to enter some data from scratch rather than load it automatically? It could take a long time to figure out how to map the data from the current system into the tables that the new system uses.

People could leave during the project (from functional offices, the IS team, or the vendor's consultants assigned to your project). It is helpful to have more than one person involved in certain areas to provide an insurance policy for key departures.

It could take a long time to get agreement about how to set up the new system. For example, security arrangements, ownership of data, which address types to set up and what they will be used for, what to do with "Jr." after a name, etc. are all potentially controversial items, but nevertheless require agreement before and during the implementation.

It could take a long time to specify the reports that need to be written or modified and to get them working right. Reports supplied with the new system are sometimes quite complicated but never exactly what people need. But reports are often the single most important item in terms of the end users' perceptions of the "success" of the new system.

Reports or processes that work for a small number of test cases might not work when you get your real data converted. They might be too slow or not finish at all, and all of this should be thoroughly checked out while there is still time to do something about it.

The cutover ——
One of the questions to consider has to do with timing: When the new system is all ready and the data is all converted, how long will it actually take to change over from the old system to the new? Will everything be ready at once? Will some data have to be maintained in both systems for some period of time? Will some normal processes (like gift recording) have to be suspended for some period of time?

One of the issues that colleges often struggle with is whether to do parallel processing. Most of the software vendors today recommend against it (with the argument that the new system has enough internal checks and balances to be able to verify itself; also, maintaining two systems is a very labor-intensive process), but it is a way to provide some measure of comfort in setting out into the new world.

Reports and queries ——
One of the things users need to decide is whether all the reports from the old system need to be duplicated in the new. Does the new on-line system make some of the old reports unnecessary? Can the information be distributed in new ways (Web pages, e-mail, extracts)?

Every report that is written creates a support commitment—if the new system's tables change in the next version, the report might have to be modified. (This has happened!) Any methods for standardizing reports will help with this: use views supplied by the vendor, use standard extracts, separate extracting from formatting.

Deciding on an appropriate querying tool for each person (if the new system provides a range of methods) is often another critical success factor for the end users. You'll need to decide who should write original queries, who should use canned queries, who should query against live data, and who should use extracts. You'll also need to prepare adequate training, documentation, and support for all these levels of querying.

> *Making sure that the right people are ready to accept responsibility for assuring things happen correctly and at the right time will help a lot later on.*

Querying is the Forgotten Module of any software system and should be allocated as much energy and time as each of the others.

Training and documentation —
You need to make sure that the right people get trained. Several people should understand each process, including someone who is going to carry out the task and someone from the management level. And right after training, there should be plenty of opportunity to use what has been learned with realistic data.

Deciding who should write each kind of documentation is another issue. Functional documentation should be written by the person responsible for that process. It is trickier to document common areas (like name and address types) that affect several areas and are subject to change over time.

Sticking together ——
One of the most important things to talk about is how the implementation teams will stay in communication. How often will the committees meet? What kinds of topics will they discuss? What kinds of decisions can the committees make on their own? Which issues will be kicked up to a higher committee? What kinds of decisions will be made by the technical experts? What consultation will take place? What means could help foster unity: newsletters, mugs, milestone celebrations, recognition by high-placed administrators?

Another consideration is providing some opportunities to sit back and enjoy the progress and the accomplishments you have all made. Recognizing the level of effort that it takes to do this right can be a major enhancement to the process.

You will enjoy the final cutover date even more, knowing that you are well prepared for the new life that lies ahead. Go ahead, take some time off and watch a movie. Maybe something like *Bringing Up Baby*. ■

A Neo-Luddite Reflects on the Internet...

continued from page 1

the advent of printing facilitated not only the production of scientific works, but also of occult and devotional tracts. It helped create a cosmopolitan secular culture and, at the same time, distinctive national and sectarian cultures. It stimulated scholarship and high culture, as well as ephemera and popular culture. It subverted one intellectual elite, the clergy, only to elevate another, the "enlightened" class.

Yet for all of its ambiguities, printing celebrated the culture of the book—of bad books, to be sure, but also of good books and great books. Movies, radio, and television made the first inroads on the book, not only because they distracted us from reading, but also because they began to train our minds to respond to oral and visual sensations of brief duration rather than to the cadences, nuances, and lingering echoes of the written word. The movie critic Michael Medved has said that even more detrimental than the content of television is the way that it habituates children to an attention span measured in seconds rather than minutes. The combination of sound bites and striking visual effects shapes the young mind, incapacitating it for the longer, slower, less febrile tempo of the book.

And now we have the Internet to stimulate and quicken our senses still more. We channel-surf on television, but that is as naught compared with cyber-surfing. The obvious advantage of the new medium is that it provides access to an infinite quantity of information on an untold number and variety of subjects. How does one quarrel with such a plenitude of goods?

As an information-retrieval device, the Internet is unquestionably an asset, assuming that those using it understand that the information retrieved is only as sound as the original sources—an assumption that applies to all retrieval methods, but especially to one whose sources are so profuse and indiscriminate. Yet children and even older students, encouraged to rely upon the Internet for information and research, may not be sophisticated enough to question the validity of the information or the reliability of the source. A child whom I saw interviewed on television said that it was wonderful to be able to ask a question on one's home page and have "lots of people answer it for you." Before the age of the Internet, the child would have had to look up the question in a textbook or encyclopedia, a source that he would have recognized as more authoritative than, say, his older brother or sister (or even his mother or father).

As a learning device, the new electronic technology is even more dubious—indeed, it may be more bad than good. And it is dubious at all levels of learning. Children who are told that they need not learn how to multiply and divide, spell, and write grammatical prose, because the computer can do that for them, are being grossly miseducated. More important, young people constantly exposed to "multimedia" and "hypermedia" replete with sound and images often become unable to concentrate on mere "texts" (known as books), which have only words and ideas to commend them. Worse yet, the constant exposure to a myriad of texts, sounds, and images that often are only tangentially related to each other is hardly conducive to the cultivation of logical, rational, systematic habits of thought.

At the more advanced level of learning and scholarship, the situation is equally ambiguous. Let me illustrate this from my own experience. I used to give (in the pre-electronic age) two sequences of courses: one on social history, the other on intellectual history. In a course on social history, a student might find electronic technology useful, for example, in inquiring about the standard of living of the working classes in the early period of industrialization, assuming that the relevant sources—statistical surveys, diaries, archival collections, newspapers, tracts, journals, books, and other relevant materials—were on-line (or at least that information about their location and content was available).

This kind of social history, which is built by marshaling social and economic data, is not only facilitated, but actually is stimulated, by the new technology. One might find oneself making connections among sources of information that would have had no apparent link had they not been so readily called up on the computer screen (on the other hand, now one might not make the effort to discover other kinds of sources that do not appear).

But what about intellectual history? It may be that the whole of Rousseau's *Social Contract* and Hegel's *Philosophy of History* are now on-line. Can one read such books on the screen as they should be read—slowly, carefully, patiently, dwelling upon a difficult passage, resisting the temptation to scroll down, thwarting the natural speed of the computer? What is

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Gertrude Himmelfarb is a professor emeritus of history at the Graduate School and University Center of the City University of New York. A version of this article first appeared in the November 1, 1996 issue of The Chronicle of Higher Education.

important in the history of ideas is not retrieving and recombining material, but understanding it. And that requires a different relation to the text, a different tempo of reading and study.

One can still buy the book (or perhaps print out a "hard copy" from the computer), read it, mark it up, and take notes the old-fashioned way. The difficulty is that students habituated to surfing on the Internet, to getting their information in quick easy doses, to satisfying their curiosity with a minimum of effort (and with a maximum of sensory stimulation) often do not have the patience to think and study this old-fashioned way. They may even come to belittle the intellectual enterprise itself, the study of the kinds of books— "great books," as some say derisively—that require careful thought and study.

Perhaps I am exaggerating the effect of the electronic revolution, just as critics have said that Elizabeth Eisenstein has exaggerated the effect of the print one. She sometimes seems to suggest that printing was not only an agent of change, but the primary agent. Without the printing press, she has implied, the Renaissance might have petered out or the Reformation been suppressed as yet another medieval heresy. "The advent of printing," she notes, preceded "the Protestant revolt."

The electronic media cannot make that claim to priority. The intellectual revolution of our time, postmodernism, long antedated the Internet. Nonetheless, the Internet powerfully reinforces postmodernism: It is the postmodernist technology *par excellence*. It is as subversive of "linear," "logocentric," "essentialist" thinking, as committed to the "aporia," "indeterminacy," "fluidity," "intertextuality," and "contextuality" of discourse, as deconstruction itself. Like postmodernism, the Internet does not distinguish between the true and the false, the important and the trivial, the enduring and the ephemeral. The search for a name or phrase or subject will produce a comic strip or advertising slogan as readily as a quotation from the Bible or Shakespeare. Every source appearing on the screen has the same weight and credibility as every other; no authority is "privileged" over any other.

The Internet gives new meaning to the British expression describing intellectuals, "chattering classes." On their own home pages, subscribers can communicate to the world every passing reflection, impression, sensation, obsession, or perversion.

Michael Kinsley, editor of the new cyberspace journal *Slate*, defensively insists that his magazine will retain the "linear, rational thinking" of print journalism. To have to make that claim is itself testimony to the non-linear, non-rational tendency of the new medium. Each article in *Slate* gives the date when it was "posted" and "composted" (archived). Composted! One recalls the computer-programming acronym a few years ago: "GIGO," for "garbage in, garbage out." (As it happens, the articles in *Slate* are not garbage, but much on the Internet is.)

One need not be a Luddite, or even a neo-Luddite, to be alarmed by this most useful, most potent, most seductive, and most equivocal invention. ■

"Scholars in the humanities need not become programmers, but the solutions offered by Java and Habanero will deliver heretofore unseen power to scholars quickly and easily with very little intervention on their part. After all, the best work done on typewriters was not done by those who assembled the machines; the best plays not written, mounted or acted by those who built the theater."

Paul Jones
"Whither Humanities and Advanced Technologies?"
Educom Review
January/February 1997

In Future Issues

- *Why reengineering is so important and how IT can help*
- *Integrated versus best-of breed: is there One Right Answer?*
- *Models of behavior for IT professionals*

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EDUTECH RESPONDS

Q. As a CIO, I know how important IT standards are for my campus, but I can't quite seem to get them established here without coming across as a dictator. All I'm trying to do is to keep support costs within reasonable bounds, but many of my users, especially among the faculty, don't see it that way—they think I'm just being a know-it-all and that I'm trying to force my way of doing things on them. How can I resolve this?

A. *There are two important strategies that you can use to make the case for standards. The first is to convince the top administration (with the help of an IT policy committee, if you have one) that the greater the diversity of hardware and software on campus, the more it costs to keep it all going, and that at some point, these costs become unreasonable. This way, you will have the necessary support when it comes time to enforce the standards. The second thing to do is to have the user community determine what the standards should be, rather than doing it yourself. In other words, the community should be telling you what they need, rather than you telling them what they should have. That process, done properly, will build the necessary user buy-in to make standards work.*

Q. We've being doing a lot with teams lately in the computer center, and overall, it seems to be working pretty well. But one thing that still bothers many of us is when we get chosen to be on a team, it sets up an immediate conflict in terms of who we report to. Once I'm assigned to a new team, do I report to the team leader or to my old boss? The two people in question don't always agree on how to do things, and I feel caught in the middle, especially if being on the team is just a temporary assignment.

C6

A. *This can be a very tricky situation, and is especially noticeable in departments that have just started using teams. The thing that is often not recognized is that one of the purposes of this approach is to bring together, in a highly cooperative arrangement, disparate groupings within the department; therefore, some level of contention is natural and to be expected. It is the responsibility of the department management to decide how to deal with this, and to develop processes for conflict resolution.*

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The Education Technology Newsletter for Faculty and Administrators

Best-of-Breed or Integrated Package: Is There One Right Answer?

Thomas Warger, Five Colleges

Is it time to take more seriously the best-of-breed approach to administrative systems? The conventional wisdom of the past two decades might in fact be giving way to this conclusion at small and mid-size institutions. With the advent of standardization in network and database software, the reigning paradigm of comprehensive packages on time-shared minicomputers may be ripe for challenge. This change is in the air at even the smallest colleges, where technological and staff size constraints formerly limited options to write-your-own or maybe to the less expensive integrated systems.

First of a two-part series

What has changed? For one thing, technological advances have put within reach inter-application data exchanges that until recently were not easy. Applications in the generation now being retired were written at a time when proprietary operating systems and purpose-written databases were the norm, making data exchanges much more difficult. In addition, network operating environments, standard database engines, and independent query tools have changed the rules of the game, but even these advances are not the whole story. Tales from the downside of integrated, comprehensive packages have become well known throughout higher education. One does not have to seek far to find someone with a horror story about the lengthy, expensive, and disruptive experience of installing a system package from even the best reputed vendors.

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"There is a close fit—a critical interlock—between the structures and processes of the Internet and some of the main structures and processes of traditional university education. The new technologies act as a powerful supplement to, and reinforcement of, forms of teaching and learning that faculty members and students for decades have found to be especially effective."

Neil Rudenstine
Harvard University
"The Internet and Education:
a Close Fit"
Chronicle of Higher Education
February 21, 1997

NEWSBRIEFS

TELECOMM SERVICES ALLIANCE

The Midwestern Higher Education Commission has announced a new Midwest Telecommunications Alliance to provide telecommunications services throughout the Midwest. The Alliance will offer services to eligible educational, governmental, and other not-for-profit institutions, organizations, and agencies. Services include long-distance voice communications, interactive video services, data communications, 800 services, calling card programs, pay phone commissions, student resale, and operator services. Future services will include Internet access and wireless services.

A $75 annual membership fee enables eligible institutions, agencies, and organizations to join the program. Program participation is voluntary and requires no long-term contract agreement. Agencies and organizations with access to telecommunications through state telecommunications agencies or central purchasing organizations are invited to participate in the program through these organizations.

For additional information, contact Greg Earhart, Midwestern Higher Education Commission, (612) 626-8288 or gearhart@hhh.umn.edu, http://www.umn.edu/mhec.

NEW TITLE FROM CAUSE

The sixteenth entry in the Professional Paper series from CAUSE has just been published. *The Crisis in Information Technology Support: Has Our Current Model Reached Its Limit?*, by Polley A. McClure, John W. Smith, and Toby Sitko, evaluates the challenges facing those who are in the business of providing information technology support on campus, outlines some fundamental changes in higher education that make old support paradigms obsolete, and proposes a new model for supporting information technology in a distributed environment.

Copies of the paper are available from CAUSE for $16.00 each for anyone on a CAUSE member campus or $32.00 each for non-members. Quantity discounts are available. E-mail orders can be sent to orders@cause.org or can be placed over the phone at (303) 939-0310.

NEW EDUCATIONAL TECHNOLOGY PROGRAM

The University of Delaware has available a new doctoral specialization in educational technology within its Ed.D. program in Educational Leadership in Curriculum and Instruction. The program is interdisciplinary, stressing the relationship between curriculum design, instructional theory, and information technology. It is based on the assumption that new media and the Internet can have a positive effect on teaching and learning, and it provides an opportunity for the doctoral candidate to consider the impact of technology on the future of schooling and to provide systemic leadership in using technology effectively.

For more information, see http://www.udel.edu/fth/edd/edtech.html.

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The prospect of getting all the administrative offices to genuine consensus on a single system is nightmarish on many campuses, many of which are looking for their second generation of administrative database software. Administrators and their staffs are now more assertive about what their applications should do, and less apt to yield to arguments that all offices must settle on the same package—compromising on functionality in order to have good integration among the pieces. IT organizations recognize that forcing the issue of off-the-shelf integration can lead to a choice that nobody really likes and that is bound to be known as "the system they made us take." Experience with one or more previous applications systems has given administrators the self-confidence to insist on better.

One of the most impressive improvements on the integrated package scene in recent years has been the ability to configure software for best fit to local practices (through extensive reliance on user-supplied tables). But the comprehensive packages might be on a slippery slope of their own making: their progress toward being modifiable and optimizable succeeds in meeting the old criticism that they imposed an alien method of doing business, but progress in the direction of flexibility exposes them to the new risk that the end users will go even farther and ask, "Why shouldn't we look for the package that does things most like we think it should?" There has been a change of balance in the assessment of value; consolidation and standardization are hard to sell now in the face of specialization, localization, and the pursuit of functional refinement.

The presence of a legacy system makes settling on a new, single, comprehensive package harder than a first-time buy. In one dimension, offices are drawn to evaluate what to keep and what to change in their own practices as they go from the old to the new. In a different dimension, they re-examine their relationships with other administrative offices and issues of process and workflow. Each office is confident that it can best determine what it needs, and that imperative is stronger than the appeal of being more closely interrelated with other offices. On many campuses the prospect of working simultaneously in these two planes seems overwhelming to the participants.

There has been a change of balance in the assessment of value; consolidation and standardization are hard to sell now in the face of specialization, localization, and the pursuit of functional refinement.

Against this background of conflict and doubt, the option to let each functional group choose its preferred software has strong appeal. The impetus to look at best-of-breed is therefore a combination of improved technological feasibility and a kind of political pragmatism. If the software products chosen by the various offices can be at least minimally integrated by the programmers in the administrative computer center (midnight exchanges of data between the different systems), then the dilemma of being either self-directed or other-connected would seem to be resolved: best-of-breed for each and some magic in the computer center.

Campuses facing a transition from legacy code that was locally written face a different set of difficulties to which best-of-breed seems a strong answer. The various functional areas have probably become very accustomed to having their wishes, sometimes down to every quirk and whim, converted into code. The problem is that programmers can no longer generate new code at the rate needed to keep up with the growing volume and complexity of needs; development cycles of two and three years are required but just not acceptable, and sometimes the horizon is even farther off than that. Furthermore, many of the legacy programming staff do not have the skills or aptitude to convert to using tools that would increase their productivity. In any event, few academic institutions can afford a staff with those capabilities. Once the end of write-it-yourself is acknowledged, the next shock sets in: choosing one package to cover all major function areas requires a foundation in common-good thinking and an inclination to compromise that feels alien to those used to custom-writing. And so, best-of-breed looks like a good compromise: buy packaged code, but let each administrative office have its own head in the deciding.

Modularization

Selecting, buying, and installing one piece at a time modularizes the process and divides the financial

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Thomas Warger is Assistant Coordinator for Information Systems at Five Colleges, Inc. in Amherst, Massachusetts.

A Framework for Advancing IT in College Courses

by Robert M. Siegmann, Clayton College and State University

It is no longer business as usual for the average college professor, as we must now begin to prepare for both the physical and the virtual classrooms of the future. The emphasis should always be on the optimization of student learning whether it occurs in the classroom or not. This means that the professor is again the master of his or her students' fate, since the structure for actual instructional delivery continues to rest with the professor as it always has. Now, however, there is more pressure to innovate and improvise, and there are tools available which can transcend location and time. The personal student/teacher interaction can always be retained, but now it does not have to be the only way to deliver content.

This article is designed to help the average college professor work his or her way through the plethora of possible available hardware, software, and communications options by proposing an evolutionary plan for the gradual introduction of information technology (IT) into every course. It is written from the professor's point of view, and is based on a number of assumptions, including that a paradigm shift is already upon us; that IT in its present form is ready for extensive academic use; that the campus infrastructure will be ready when the professor needs it; and that a re-engineering of course delivery can be made pedagogically sound by each professor.

The paradigm shift

A number of factors point to the upcoming paradigm shift in the way instruction will be delivered to college students. The tools of IT have been available for some time, but now the academic climate is ready for their introduction. The corporate entry into education, the need for more cost-effective delivery, and the slow demise of tenure are combining with the universal availability of IT to create a volatile environment. One result is that many professors will be prompted to restructure the way they teach.

We will also begin to see trends:

> *The corporate entry into education, the need for more cost-effective delivery, and the slow demise of tenure are combining with the universal availability of IT to create a volatile environment.*

away from using only one teaching method (e.g. lecture) and toward more creative options inside and outside the classroom (e.g. interactive multimedia methods); away from the learning responsibility resting solely on the professor and toward a joint responsibility with the student; and away from classroom-only interaction with students to more electronic-based asynchronous communication outside of class.

The framework

Nolan and Gibson, in a *Harvard Business Review* article in 1974, proposed a four-step model (subsequently extended to six steps by Nolan in 1978) for how businesses evolve over time in their use of data processing capabilities. Using their work as a basis, I suggest that the evolution of using IT in a college classroom should take a similar progression.

A note about infrastructure requirements: Appropriate campus resources must be made available to the professor who is willing to use the new technologies. For example, without the flexibility and portability of laptop or notebook PCs, professors cannot adequately move their instructional basis from the office to the classroom. There is significant institutional expense in providing the appropriate infrastructure to adequately support professors who want to use the technology, but without at least basic support, there is no need for a professor to embark on the mission to use IT in the classroom.

Initiation. In this beginning step, IT is introduced in a basic way. The professor finds some way to use the technology in the classroom. Often it takes awhile for the use of the technology to expand and for the professor to become comfortable with it.

In this first step, I propose a minimum use of IT. In-class use of presentation software could replace some or all of the use of manual overhead transparencies. Software can be used by both the professor and the students for course-related presentations. Out-of-class use of the technology can begin with the simple use of e-mail for class assignments and general communication. The infrastructure requirements for this step are minimal. PC labs need to be available for the students to use e-mail and to develop presentations.

For the professor, a portable PC is required, so that parts of lectures can be prepared in the office and easily transported to the classroom. The only classroom equipment needed is some type of data projection unit for connection to the teacher's PC and presentation software.

Contagion. In this step, the use of technology has progressed significantly and the professor begins to look for other applications to incorporate into instruction. Enthusiasm on the part of the professor and the student builds rapidly.

The extensive use of the Internet is the vehicle by which contagion can take place. Once inside the Internet, student and teacher will never be the same again. I propose that Internet connections to appropriate sites be occasionally made during the class and that bulletin boards and students' papers, written in Hypertext Markup Language (HTML) and posted on a class home page, be a part of the out-of-class activities. This extensive use of the Internet requires that the infrastructure provide for network connections in classrooms and in the student PC labs. Because of the wide resources available by textbook publishers and others on the World Wide Web, this step will surely lead to the contagious use of this technology.

Control. More use of the technology puts demands on the infrastructure and brings to life external and internal administrative controls. The professor assesses the growing demands on his or her time, and the campus support systems begin to feel the impact of increased usage by teachers and students. Cost/benefit considerations come into play here.

The multimedia aspects of the Web can be brought into the classroom with the use of multimedia PCs. Multimedia PCs allow for a more enhanced presentation of course-related information. The teacher and student presentations can now use multiple types of media for both in-class and out-of-class assignments. This step usually requires a great commitment and expense for the infrastructure organization. At this step, all campus PCs (or at least the PCs used by the students in the particular course under discussion) need to be converted to multimedia PCs, each having CD-ROMs and speakers.

> *It's all right to plateau at any step. The goal is not to reach "maturity," but to enhance learning under your direction. When you learn more, you can challenge yourself to move on to the next step.*

Multimedia software for use by students and professors also needs to be purchased, and classroom projection equipment must be upgraded to include speakers. This control step should be used by the professor to assess the impact of information technology on the students and to be sure that teaching objectives are being met.

Integration. The important characteristic of this step is the need to integrate the various applications and uses into a more meaningful package. It is important to be sure that the instructional objectives of each course are being met by using the appropriate technology. This step adds "groupware" to the course environment. It provides a good way to integrate all the previous (sometimes incompatible) software used in the course. Groupware allows a rich means of providing out-of-class structure and focus for student/teacher interactive work and for student project teams. In-class use of group decision-making software can provide for contests, voting, and consensus building. Infrastructure impact is heavy for both hardware and software. All students now need their own portable PCs with compatible software. Also, on-campus connections for the portable PCs need to be in classrooms and work areas and a means of providing Internet access from home is also helpful.

Maturity. This step may never fully occur. In this utopian state, all aspects of instruction are working in concert with the best of the technology available.

Maturity comes when most of the information for a course can be communicated asynchronously in a type of "virtual classroom" environment. Infrastructure requirements center around high-speed communication capabilities for students and professors, even from their homes. With this use of technology, classes need only meet when necessary, not just on a fixed schedule. More course-specific software is required so that the fullest use of the technology can be achieved. It is clear that this step may never by reached for some courses, but for others it should be achievable.

General observations

Based on the model and its application in a teaching environment, a number of general observations become apparent.

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Robert Siegmann is a Professor of Computer Information Systems at Clayton College and State University.

Best-of-Breed or Integrated Package: Is There One Right Answer?...

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impact into smaller hits. In principle, each functional area can be addressed without locking the institution into lengthy and costly commitments to do similar for the others. Because each area's system can be selected and implemented with less need to coordinate with offices from other areas, the process is politically and technically simpler than in any approach that requires them all to mobilize time and attention at the same time for data definitions and process flow analysis. Institutions facing strongly competing claims on their technology dollars are likely to welcome the prospect of dividing the administrative systems issue into manageable chunks and reserving the ability to decide each according to priority of need and the availability of funds.

Best-of-breed also has the financial virtue of allowing a different price-performance determination for each functional area. Comprehensive packages, in contrast, impose a single decision. If package X is the best because it excels at admissions or fund-raising, is its price also justified for student housing, grade records, parking tickets, and payroll, or should each of those be evaluated separately and according to varying levels of priority? The evaluations may be different at each institution, but in no case are they likely to be identical across the board.

No comprehensive package is truly all-inclusive any more. Library automation, telephone resale, infirmary medical records, hazardous materials tracking, HVAC management, point-of-sale, and dining services functions all represent systems outside the purview of comprehensive packages but might exchange data with core administrative systems—such as purchasing or billing. Ten years ago we would have ruled those systems outside the realm of central support, but now the role of the central programmers is increasingly to enable inter-application exchanges, an orientation that situates them well to implement best-of-breed.

Staffing implications

The comprehensive packages have grown large and complex. While they require fewer central staff to support than a home-written system, they have not generally enabled enough reduction of staff positions to offset their high purchase and maintenance charges. One major area in which labor reduction has not occurred is in ad hoc report generation. Query tools and report writers have generally proven beyond the ability of office staff to operate without considerable assistance from programming staff. In fact, it is not unusual to find that programmers build batteries of custom reports for each administrative office. Comprehensive packages have reduced to very little the need for an institution's programmers to alter the application's code, but they still require significant interventions by programmers to aid user offices in table maintenance and in ad hoc query and report functions. In these shortcomings they have perhaps given away an important amount of the benefit they promised: a way out of the cost drain of programming support. Having failed to become turnkey systems, they leave in place the programming staffs whom the institutions might instead ask to assist in best-of-breed system linkages.

The trade-offs

Having a wider range of choices for many administrative functions offered by the best-of-breed approach seems intuitively a good thing, especially where a vendor's specialization results in a better product. It also plays out the logical extension of distributed computing and information architectures by giving the lead in choice of system to administrative staff.

On the other hand, best-of-breed gives away true integration among applications modules, settling instead for a few points of data exchange. It also entails a continuing level of programmer involvement for the assurance of linkage among the systems—a particular challenge when reconciling the differing upgrade scenarios that are bound to occur within the mix of platform technologies and layered applications. Liaison with numerous vendors must be thought of as a cost in its own right. Training costs are likely to be higher because of the multiple systems. Central staff will have to be familiar with several systems or will have to be more numerous themselves to provide that support. If administrative offices work directly with the systems vendors, then there is almost inevitably a three-way relationship including the college or university's support staff.

In some ways, best-of-breed is a retreat from the main difficulties posed by the comprehensive, integrated systems: the large block of cost, the difficulty of attaining consensus among the administrative offices for the choice of one system in common, and the upheaval of replacing every office's system module in a falling dominoes pattern—each one affected in sequence. But from another angle, it might be the most logical approach to take advantage of the two most significant trends in administrative computing today: the standardization of network and database platform technologies and the administrative offices' insistence on determining their own applications functionality. ■

A Framework for Advancing IT in College Courses...

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Student/teacher interaction will become more asynchronous. The introduction of e-mail on college campuses a few years ago opened up a new chapter in student/teacher communication. At any time, day or night, we can now communicate with each other. This trend will continue and will be focused more toward course-related learning objectives.

Both professors and students are impacted by the paradigm shift. As instruction moves toward more use of IT, the first impact will be on the professor. IT will only impact instruction to the extent that the professor allows and fosters it. Only after it is designed into a course will the students also have to live and adjust to the new paradigm. In the final analysis, the impact will be mostly on the student who will be "forced" to learn and to use new methods on their way to digesting course content.

Some disciplines are more IT-ready than others. Disciplines are not equal when it comes to having a wide variety of course-oriented software available. We cannot expect all professors to generate new multimedia course material for each of their courses. But as more and more new multimedia software becomes commercially available for a particular discipline, it will have a ready market with those professors who are ready and willing to use it.

Reaching "maturity" should not mean the elimination of all in-class contact. Face-to-face contact is important and need not be totally eliminated with the extensive use of IT. Each professor must decide on the appropriate mix of in-class and out-of-class work. At maturity the optimum mix will be obvious.

Action guidelines

Start with a positive mindset. Technology is not inherently good or bad. It is a tool to be used by those who desire to use it. Begin with a desire to use this powerful tool to improve the students' learning, while still providing your unique contribution to the instructional process.

Don't worry about how to get started. Jump in and get started. The first steps are not difficult at all and should not put a strain on your energies or time.

Take one step at a time. Don't get in over your head. Select one course and one new IT application to get started. Then add new features each semester as you are able.

Experiment with other ideas. I have presented only an outline of possibilities in this article. There are many others. Also feel free to create your own. It's OK to piggy-back on what others around you are doing.

It's all right to plateau at any step. The goal is not to reach "maturity," but to enhance student learning under your direction. When you learn more about the technology, then you can challenge yourself to move on to the next step.

Enjoy yourself. As you become more familiar with the technology, so will your students. We learn more when we enjoy what we do! Use the technology as a tool to help students reach the learning objectives and thereby to enhance instruction. ■

"The Internet reinforces the conception of students as active agents in the process of learning, not as passive recipients of knowledge from teachers and authoritative texts.... Seated before the computer, a student is challenged to make something happen, to act or pursue, rather than merely react or absorb."

Neil Rudenstine
Harvard University
"The Internet and Education: a Close Fit"
The Chronicle of Higher Education
February 21, 1997

In Future Issues

- *Integrated package or best-of-breed: is there One Right Answer? -- Part II*
- *Why Johnny (and Jeannie) can't compute*
- *Ludd vs. hype: keeping your head*

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EDUTECH RESPONDS

Q. We have a question about what role the director of computer services should take during the implementation of our new administrative system. Some on our campus say he should be a leader, since he knows more about technology and systems than anyone else on campus. Others say he should be just a follower, since the system will belong to the users, and it's up to them to provide leadership. Which model is the most effective?

A. *Either one will work, depending on the circumstances and personalities of those involved. But the most effective is neither of these two. The one that works best is when the director of computing (or anyone from the computer services department) serves as a facilitator. Neither a leader nor a follower, a facilitator is a guide and a counselor, usually within a team. The implementation of a new system is a partnership effort, involving both the users and the computing support staff, and often, an outside vendor as well. A great system will emerge only if everyone is working together as a team.*

Q. We're in the midst of reconfiguring a variety of technology support areas under a single umbrella organization, and have made good progress so far. The thing we're stuck on at the moment is where the umbrella belongs. The various support units that make up the new organization have come from the purviews of three different vice presidents, and each one of them can make a case that the new one "belongs" with him or her. One answer is to have the umbrella report directly to the president, but in our case, that won't work, because our president is not at all interested in technology and won't give it the attention it deserves. Is there a good way to resolve this?

A. *Your last statement is both the root of the problem and the basis of the answer to it. The umbrella should report to the president for a multitude of good and appropriate reasons, but in your case, most of all because you have a president who isn't interested. The sooner that is no longer is seen by anyone as an acceptable attitude, the better, and needing to provide direct leadership for the campus IT organization is one way to make that difference. Our experience suggests that most presidents will rise to the challenge, and that everyone is better off as a result.*

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The Education Technology Newsletter for Faculty and Administrators

Best-of-Breed or Integrated Package: Is There One Right Answer?

Thomas Warger, Five Colleges

In institutions of fewer than 10,000 students, the comprehensive, integrated administrative computing package has been the ruling paradigm for more than a decade. The king of the hill is always an obvious target, though rarely easy to bring down. During the 1980s these packages demonstrated they could bring good database applications service to the core administrative units and give the campus a reasonably good flow of information processing that would follow a student from admissions prospect through alumnus/a status. There is perhaps no better sign of the success of the business sector represented by the package vendors than the shake-out and consolidation that has occurred in recent years, so that the same two or three names come up on everyone's short list at purchase time. Another testimonial to the strength of the market for this product has been the moderate but impressive success of packages that have built up from being PC- and LAN-based to compete with the minicomputer-hosted systems. Even a few vendors of older systems (sometimes wrapped in new technologies) have managed to hang in, such is the hunger at even the smallest colleges for an integrated package.

Second of a two-part series

In the late 1970s and early 1980s, software found its way out from a few campuses to become the nuclei of what became commercial products. They have met every imaginable fate—and some pretty nearly unimaginable—but none that has survived

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"Even today, when technology, global competition, and changing demographics are remaking America, the nation's traditional liberal-arts college remains largely unchanged. Most still eschew anything that smacks of real-life training; professors stand before rows of students, reciting facts that must be memorized to pass a test that will be graded on a curve. Graduates may know how to speak three languages but not how to speak in public. Administrators spend an increasing amount of time holding out a tin cup."

"Education on the Edge"
The Wall Street Journal
March 6, 1997

NEWSBRIEFS

EDUCOM MEDALS

Four disciplinary societies will partner this year with Educom to honor innovative individuals who have demonstrated that information technology can improve the undergraduate learning experience. One winner will be chosen by each of the participating societies: American Philosophical Association, American Political Science Association, American Society of Mechanical Engineers, and the Geological Society of America. The winners will be honored during a special presentation at EDUCOM'97: Embracing the Changing Learning Environment, scheduled for October 28–31, in Minneapolis, Minnesota. For more information on this year's program, call (202) 872-4200, send e-mail to awards@educom.edu, or visit the Educom Web site at http://www.educom.edu.

ASCUE CONFERENCE

The Association of Small Computer Users in Education (ASCUE) will be holding its 30th annual Summer Conference, June 8–12 in Myrtle Beach, South Carolina, "IT for the Whole Campus." Presentations will cover a range of topics including networking, Internet/Web site, technology in the curriculum and assessment, administrative issues, and faculty/staff/student support. The conference will also include a variety of hands-on pre-conference workshops and a number of roundtable discussions on a range of topics from coping with the Web to supporting faculty use of instructional technology.

The ASCUE conference is typically very informal, both in dress and presentations; the atmosphere is very friendly and welcoming. For more information, contact Chris Schwartz, 1997 Program Chair, ASCUE, Ursuline College, 2550 Lander Road, Cleveland, OH 44124; (216) 449-4471; cschwar@en.com.

CAUSE ELITE AWARD NOMINATIONS

CAUSE is calling for nominations for its annual *ELITE* (Exemplary Leadership in Information Technology in Education) award. The winner of the *ELITE* award will possess exemplary professional skills, leadership ability, and vision. The candidate must be or have been directly associated with managing information resources in higher education and will have met all of the following criteria: attained a level of national or international prominence within and beyond the profession; exhibited exemplary management and leadership qualities, both in the management of an organization and the ability to inspire and lead people; advocated the importance of information technology in supporting institutional goals; enhanced the profession through presentations, publications, consulting activities, etc.; contributed significantly to the field through outstanding career achievements; and communicated effectively with those outside the profession regarding the importance of managing information resources on campus.

Further nomination information is available on the CAUSE Web server: http://www.cause.org.

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looks much like its earlier self. The history is not very instructive in itself, but some of the original characteristics of this generation of software haunt the field even after they have been overcome. At one time the software rather closely implemented a single mode of doing business, each package bearing the marks of the institutions from which its parts derived. To this day it is still common to hear that any comprehensive package could not possibly be acceptable because it represents someone else's ideas on how a college or university operates. Lost is the realization that the basic nature of the packages is now substantially different. The vendors have gone to great pains to evolve systems that have structure and consistency and yet also succeed in generalizing their approach to administrative functions so that they can be adopted at institutions with varying local practices.

Today's package is really an intricate framework waiting to be filled in. The fundamental applications are built on inference from general practices in higher education and governmental regulations, giving an architecture that is at the same time resilient and flexible. Table entries implement data definitions and rules of process as determined by the buyer and give the product its ability to accommodate the inevitable differences that are found from campus to campus. The engine is expanded and refined by a large corps of programmers at the vendor's headquarters, working to a standard of process that is rare in any setting and still beyond the capacity of most campus programming departments. These qualities define the current crop of comprehensive, integrated packages.

What does the field of possibilities look like today? Write-it-yourself is either the last resort when acquiring suitable software seems impossible or administrative offices have succeeded in converting their hunger for custom-written applications into programming budget and staff. The major liability of this approach is the unacceptably long development cycle, even with fourth-generation technology and CASE tools. Things are moving too fast for most programming shops to keep up. Best-of-breed, on the other hand, has been hindered by incompatible operating systems, networks, and databases. Even though best-of-breed is less daunting today, the glue in this kind of administrative computing system is still up to the programmers; the illusion that disparate applications products work together easily depends on the skill of the technical staff.

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How, then, should we think about costs and benefits of the integrated packages? Purchase, license, support fees, and support staff are the most obvious areas of cost. Over time the people costs are the highest. The package vendors traditionally have claimed that part of the purchase price can be recovered by reductions in computer center staff that their product makes possible. That saving is often problematic: the positions eliminated need to be in programming, which is most likely to be possible only when the previous approach was write-your-own. The vendors have consistently under-represented the difficulty of ad hoc queries for end users and the generation of custom reports; most campuses find they need to support those functions with programming staff.

The chief benefits are the standardization of application characteristics and the assignment of ultimate support responsibility to an outside provider with deep resources. Standardization is the opportunity to economize on support across the board: peer training and mutual aid arrangements among administrative offices are the fundamental alternatives to some aspects of support from the computer center. Cost reduction is not likely to happen by itself. We have never been determined to take potential savings by targeting cuts in advance. Still, the package approach to software has the best potential for support staff cost reduction. Best-of-breed requires that there be some deeply knowledgeable staff in end-user offices since central staff are not going to be able to learn applications down to fine detail in several products. Write-your-own is too often characterized by endless wish-lists that keep both requestors and programmers too preoccupied with bigger-better-more rather than real progress in productivity.

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Thomas Warger is Assistant Coordinator for Information Systems at Five Colleges, Inc. in Amherst, Massachusetts.

Ludd Versus Hype: Keeping Your Head

Technology and learning are emotion-laden topics and the idea of putting them together is even more likely to initiate a debate. With such fundamental values at stake, some participants cast their opponents in extreme positions as well as taking extreme positions themselves. This can lead to very chilly conversations. Technology leaders try to defuse this polarization, while trying not to get themselves defined into one extreme position or another (or worse, find themselves identified with both extremes—depending on which kind of extremist is using them as a whipping post at the time).

Ned Ludd was the probably mythical leader of the early nineteenth century labor activists called Ludds or Luddites who went around in the night smashing the textile machines that threatened to make their trade obsolete. Hyperbole is the ecstatic utterance of a late twentieth-century person who has experienced the exhilaration of technology at its best and wants to share that vision with others. In their contemporary versions, neither Ludds nor Hyperbolists probably really believe fully in their most extreme statements, but they feel a missionary zeal to push their ideas as forcefully as possible to counteract the errors of the other side.

Ned Ludd's modern followers don't break machinery—it breaks down often enough on its own without needing to be sabotaged. These self-described Neo-Luddites are altruistic, values-oriented, and often have impeccable academic and technical credentials. On the national scene they include luminaries like David Gelernter, Gertrude Himmelfarb, Sven Birkerts, and Cliff Stoll. On your campus the Ludds may be represented by the *eminence grise* who rises in the faculty meeting to sound the alarm against the excesses of technology—sometimes the very same person who pioneered the introduction of technology on campus years ago.

The Hyperbolists of technology are also on a mission. Besides spreading their vision, they sometimes feel called upon to destroy the vestiges of establishment and superstition that stand in the way of making that vision come true, although they usually put it more politely. You can't help but be stunned by the clairvoyance and imagination of a Nicholas Negroponte or the chutzpah of a Bill Gates, while at the same time you begin to worry which side of the barricades you might find yourself on when the (mainly economic) shooting starts. Closer to home, your local Hyperbolist may be a recent convert who is rushing forward to embrace technology, and rises in faculty meetings to refute Professor Ludd. His teaching has been totally transfigured by technology. Sure, there have been a few problems along the way, but he is confident that the Computer Center will solve those soon.

> *In our planning for technology in higher education, we need to frame the discussion on those principles to which we have a long and deep institutional commitment and make sure they don't get blurred into the merely accidental details of how college life has been conducted in our time.*

In our planning for technology in higher education, we need to frame the discussion on those principles to which we have a long and deep institutional commitment and make sure they don't get blurred into the merely accidental details of how college life has been conducted in our time. We need to do a kind of phenomenological reduction on our core business. Since the debate about the extremes can easily derail that effort, here is a guide to some of the whirlpools that you may find yourself having to steer between.

Ludd: *Young minds are dumbed down by the glitz and speedy gratification of multimedia.*
Hype: *Young minds can be motivated to learn by the richness of multimedia.*
Is multimedia the equivalent of Ritalin, or is it closer to KoolAid? The pharmaceutical metaphor obscures the essential role that teachers play, no matter what the level of technology. Young minds can spread their wings and strengthen their muscles moving through a rich knowledge landscape as long as they have a capable and skillful guide/teacher at their side.

Ludd: *Computers destroy the capacity of the user to think linearly, rigorously.*
Hype: *The opening of cyber-multi-dimensionality (footnotes upon footnotes) makes the learning experience richer.*
Linearity is one mode of learning and of expressing arguments, and often isn't all that linear as the physical pages it is printed on make it seem. Hypertext is another mode, and can be done well or poorly. Both are here to stay.

Ludd: *What ever will happen to our students once the gate is let down and they are exposed to all those fallacious pseudofacts and seductive inaccuracies of cyberspace without the assistance of recognizable authority to certify reliable sources and weed out the garbage?*
Hype: *What a great world it will be when we finally break the iron grip of schoolmaster authority and learners can explore the wonderful world of knowledge on their own!*
We have always recognized that education does not consist of merely filling up students' heads. There is a multi-step process: collect some data, evaluate it, repeat. The guide/teacher helps in the original direction-setting and helps in the evaluation, but the point of education is for students to develop their own evaluative skills (and they probably have a better baloney detector than many give them credit for). Cyberspace is a great place to hone these skills, but with coaching appropriate to the learner's level.

Ludd: *Cyberspace is full of junk. Much that we value is not represented at all. The Web has no history.*
Hype: *Cyberspace puts everything at our fingertips. If it isn't on the Web, it's probably not important.*
The Web is the imperfect fulfillment of an amazing idea—turning all the documents in the world into a single document space and using technology to provide access to those documents. We are witnessing the beginning of a huge construction project that will extend for decades and profoundly change the world.

Ludd: *Technology just deals with the surface of things—moving words around in word processing, putting weak arguments into impressive-looking laser fonts. The real values reside in things like the Great Books, which you don't need a computer to read.*
Hype: *Look at this wonderful pilot project we are doing! Please note that we are using technology to do it. Otherwise we are doing just exactly what we did before. But these machines make it revolutionary.*

> *One of the earliest Luddisms was, "The word processor is only a glorified typewriter." The "glorified" typewriter has now become something many of us can't live without, that even Ludds use without apology. What did that "only" mean anyway?*

Does technology deal with the surface, missing the essential values, or is it a value in itself? Can we get beyond that dichotomy, get comfortable with the idea that technology adds real value in some cases, without having to defend the indefensible idea that technology in itself is an ultimate value? One of the earliest Luddisms was, "The word processor is only a glorified typewriter." The "glorified" typewriter has now become something many of us can't live without, that even Ludds use without apology. What did that "only" mean anyway?

Ludd: *The computer and the network are killing off the human aspects that make life and learning worthwhile, turning us and our students into Robo-Wonks. Soon there will be no students browsing in the library or congregating in dorm hallways; we will forget to bake brownies with the kids or make a garden next spring, because we will be glued to the glowing screen of Svengali 97.*
Hype: *The new on-line community is better than mere face-to-face contact. The bright but timid or overlooked student will finally have equal say once our classroom discussions are transplanted to Cyberspace. The horizons of our students will expand to include other students and scholars throughout the world. By posting their own Web sites, students will finally create the intellectual global village that will make Teilhard de Chardin's noosphere look like Levittown.*
The new community of cyberspace already exists and is already shaping the future of how information will circulate and grow in our world. So we might as well not waste our time talking about whether to abolish cyberspace, the way we might decide not to pipe MTV into the dorms. But we don't want to let the on-line world swallow up or replace the campus either. The campus must become a very specialized kind of neighborhood, located on strategic ground, like early cities that developed at the mouths of rivers. To succeed in this transformation, we must look again at our basic educational mission and see how it needs to be reimplemented within the new landscape that has sprung up around our campus walls. That will take a lot of thinking and detailed work, not just uncritical enthusiasm. Oh, and dealing seriously with the on-

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The depth-of-support benefit has been distressingly weak in the experience of some colleges and universities. At times, the leading package vendors have simply outgrown the size and quality of their support workforce and given poor service—particularly on installations—as a result. In at least as many of the other unhappy experiences with those vendors, the fault lies at least partly with the customer. Sometimes administrative offices have failed to keep up their end in preparation or training and found it easy to blame the vendor. This slippage is made easier when it happens against a backdrop of resentment about feeling coerced into a system the participant offices did not choose.

A darker problem is that we don't do a very good job of reasoning the value of information systems. Truly superior software for admissions should make a difference in the students admitted, whether in quantity, quality, diversity, or other strategic criteria. The registrar's office should face the same test. Administrative activities that cannot make a strong case for accountable gains from their information systems should be expected to improve their productivity through cost reductions, even if it is just their participation in overall lessening of computing support costs. The evaluation process gets lost in a political thicket when assertions about needs and values do not face hard scrutiny in administration-wide discussions of information system choices. Absence of managerial discipline does more than any other factor to undermine the option of adopting a software package in common across a whole administration. It is just too easy to accommodate differences of opinion by allowing separate decisions, even though they might, when added up, amount to the loss of the best opportunity to take reductions in support cost. The comprehensive package cannot be justified on the ground that it is best in all function areas, therefore it needs to be reasoned on a balance between good overall quality and the opportunity to reduce staff costs.

Conclusions

To the extent that technology indicates an answer to the one-package versus best-of-breed issue, it is more a matter of trend and balance. Best-of-breed is getting easier, and has gained stronger credibility in just the past year, roughly coincident with the surge of Microsoft's NT Server. Those who are impatient with the persistence of time-share computing on minicomputers are inclined against the integrated packages. Those who are alarmed at the growth in workstation and fat clients are cautious about the costs of truly distributed applications systems. In any case, office productivity software suites are now the standard-setters for the look and feel of computing from the end-user's perspective, and so the competing technologies in the best-of-breed and package confrontation are being upstaged by what is happening on the desktop.

Politics and campus culture are probably now more influential in pointing an institution to one route or the other than reasons based on technology. The challenge of bringing disparate offices into consensus is often sufficient to determine campus direction. Still, it would not be fair to categorize the best-of-breed camp as those who fail to control their factions; an institution confident it can guarantee the linkage of systems chosen on separate cost/benefit evaluations can now make a strong case for the validity of that approach. The point is instead that those who cannot unite institutional criteria that are stronger than any factional tendencies will have a hard time taking the integrated package approach.

Packages are probably a harder sell now with many campuses moving to their second or third generation of administrative systems. The end-user offices are more experienced and assertive than in the past; some are even out to redress what they see as errors or injustices in previous choices. This atmosphere is not conducive to choosing a package in common, given the need to compromise and subordinate local preferences to criteria held in common. It may be better to make more choices and to respect the judgment of those closest to the work, but the sum of the cost/benefit determinations in multiple best-of-breed decisions is not reliably the same as the aggregate. Viewed from another perspective, the consequences of difficulties resulting from any of those choices tend to collect centrally, and only partly in the domain of those who made them. In that respect, the package option carries less risk because the vendor is on the hook for integration of the parts (and customers generally don't pay for each module until it is proven to hook into the others as it should).

Academic administrators have a lot to learn yet about the assessment of risk in the decisions they make. The best-of-breed versus integrated package is a hard case in that discipline. We may be reaching a crisis of confidence between senior administrators and information systems leaders as technological criteria fade in importance relative to campus politics and culture. There are significantly different, viable options for administrative software systems now, but making a good choice is less a technology decision than at any time in the history of computing on campuses. ■

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line world shouldn't have to get in the way of being human, any more than operating single-user cellulose-based informatons ("books") gets in the way now.

Ludd: *Technology will cost us too much, robbing us of the money we could be using for new copies of Cicero's* Orations *for the library, or for faculty raises.*

Hype: *We have simply got to have the money to buy a new [fill in the blank] for every [fill in the blank] —immediately!*

These are big, on-going expenditures and we had better figure out how to pay for this stuff in a regular way, without breaking the bank and laying waste to the rest of the institution. This balancing-act budget needs to be based on our institution's values. Sounds like a job for a high-level campus planning process.

Ludd: *Stop the madness! Immediately! No more techno rot!*

Hype: *Crisis! Emergency! Full speed ahead!*

We have to start now, but we also have to recognize that we can't get there tomorrow.

Ludd: *Society is falling apart because of computers, and we have to stop it.*

Hype: *We in the university are in a unique position to make the technology revolution happen.*

We who steer higher education are mostly spectators as mighty market and cultural forces vastly bigger than us clash. Technology's progress is much less under our control than we would like to think. Our campus is not hermetically sealed. At one time we could think of ourselves as designing how our faculty or students would learn about computers and what they would be exposed to. That is long out of our hands. Our constituents live and breathe in a computerized and connected world, and that includes prospective students and incoming faculty. But we are talking about radical change here, and that takes time. Not waiting and watching time, but planning, acting, incrementally changing time. Just talking about change doesn't count. But the plan had better include realistic expectations about how gradual the change is going to be, even if we are pushing it as hard as we can.

Ludd: *Well, maybe it is okay if the institution runs some pilot programs involving some people who really want to do this (they probably won't get tenure anyway). But I don't want any part of this!*

Hype: *Let's require everyone to change immediately how they teach!*

The transformation does need to be institution-wide. That doesn't mean that every person needs to take part, but every department, every discipline, and every program needs to rethink itself in terms of the new technology. The Ludds are right to point out that radical change like this can't take place overnight. But you have to start climbing the mountain, not just sleeping at the foot of it. Unless the entire institution is setting off in the same direction, the program won't make sense to students, who should be able to experience their education as a whole. Say, maybe there's something on the Web about this. ■

"In most institutions, customers have no idea of the impact of their consumption on the support organization; they mainly know that their own needs are no longer being met. Also, many have no idea of the cost of the services they want because we have set up economic systems that hide that information from them. Under the conditions we have created, it is likely that they will conclude that we are not doing our jobs."

Polley A. McClure, John W. Smith, Toby Sitko
The Crisis in Information Technology: Has Our Current Model Reached Its Limit?
CAUSE Professional Paper #16

In Future Issues

- *Can IT groups be trusted to teach computing?*
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EDUTECH RESPONDS

Q. We're installing new administrative software, and one of the things our software vendor has suggested to us is to attend their annual users meeting. It's quite a distance from us, so we need to consider this carefully. Is this usually a worthwhile use of time? Who from the institution should go?

A. *The user meeting is almost always an extremely valuable resource. It is a unique opportunity to meet a large number of folks who are going, or who have gone, through the very same experience as yours, so just from an information-exchange point of view, there is much to be gained. Not just the discussions about avoiding implementation pitfalls, but also exchanging approaches, report formats, and even software can pay for conference attendance many times over. The other piece, complementing the peer exchange, is the vendor/customer dialogue. They learn from you what you need, and you learn from them what their plans are (hopefully, there is some correspondence here). At the very least, the implementation project manager from your institution should attend, but ideally, you should send as many people as possible, both technical staff and users.*

Q. I have a short question, which I wish was as simple as it is short. How do we get our president to acknowledge the importance of technology on this campus?

A. *The good news is that more and more presidents are acknowledging this. More good news is that increasing numbers of people on every campus, including both faculty and administrators, are realizing that technology is a strategic asset with which the institution can become both more effective and more efficient and it is inevitable that this sentiment will eventually bubble up to the presidential level. Unfortunately, this does not serve to predict the attitudes of individual presidents on individual campuses. But the combination of mounting internal and external pressures, including the need for a college to be accountable to its constituents, the amount of competition from non-traditional providers of education, and the financial constraints coming from a variety of sources, make it imperative for the institution's leadership to be aware of the tremendously valuable resource represented by technology, and to actively seek to tap into its potential.*

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